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**A COMPARATIVE ANALYSIS OF MEASURES AND
REACTIONS TO EPIDEMICS FROM THE 14TH
CENTURY TO THE PRESENT DAY IN EUROPE**

Supervisor

Ch. Prof. Giulia Delogu

Assistant supervisor

Ch. Prof. Laura Cerasi

Graduand

Elisabetta Zanandrea

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854065

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Ai miei genitori, Roberta ed Ennio, e a mio fratello, Mattia.

ABSTRACT

La storia umana è formata dal susseguirsi di eventi, innovazioni e sviluppo. Quando si parla di eventi storici, c'è la tendenza a concentrarsi principalmente sui cambiamenti apportati grazie alle innovazioni tecnologiche, alle rivoluzioni, al miglioramento dell'economia, delle tecniche agricole e di sviluppo e via dicendo. C'è tuttavia un fattore che agisce alle spalle di tutto in maniera silenziosa ed inesorabile; esso è promotore e allo stesso tempo causa del cambiamento, e spesso viene dato per scontato o considerato un fattore integrante: le epidemie. Studiate solitamente nel complesso dei processi sociali, ho rilevato che questo argomento meriterebbe di essere approfondito a parte, come uno dei motori e promotori del cambiamento e innovazione della società. Come si evince dal titolo, la mia tesi verte sulle reazioni (e conseguenze) che le epidemie hanno scatenato sia nei soggetti pubblici, ossia gli stati, che in quelli privati, ossia la popolazione del/degli stato/i dell'Unione Europea interessato/i da esse.

Il presente elaborato si interessa dunque all'analisi delle misure adottate dai governi nei confronti delle epidemie, e le reazioni che le persone stanno avendo e che hanno avuto nei confronti di esse. Ho individuato il XIV come secolo di partenza, dopo aver riscontrato che le prime vere ed importanti misure contro le epidemie sono state elaborate a partire proprio da questo periodo; la peste bubbonica, o "morte nera", stava flagellando l'Europa in una maniera così devastante che fu necessario pianificare dei provvedimenti di contenimento dell'epidemia su iniziativa politica. È interessante notare che la mancata elaborazione di sistemi efficaci per la prevenzione del contagio ha un epicentro: la scarsa formazione e studio in ambito medico-scientifico. Fin quando non vennero scoperti i germi nel XIX secolo, la medicina ufficiale si basava ancora sul *Corpus Hippocraticum* del IV secolo, che sanciva che la salute si basava sull'equilibrio degli "umori corporali". Successivamente, venne introdotto un concetto simile al contagio, ossia la teoria miasmatica, secondo la quale le malattie venivano diffuse dall'atmosfera avvelenata/contaminata che penetrava attraverso i pori della pelle. La conoscenza medica era principalmente teorica mentre lo studio pratico (ossia la moderna chirurgia) era solitamente escluso se non, addirittura, ridicolizzato. Per un lungo tempo si pensava che la causa delle malattie si basasse o sul disequilibrio degli

umori, o su entità maligne/benigne o che fosse causata dai “miasmi”. La responsabilità delle epidemie ricadeva su ipotetici peccati del singolo (ad es. streghe e untori) o di gruppi di persone (ad es. ebrei e stranieri) che venivano perseguitati e in molti casi anche processati, torturati e giustiziati. Anche dopo la scoperta dei germi e le prove empiriche della loro effettiva esistenza, poter credere che la causa delle infezioni fossero “minuscoli animaletti” che infettano il nostro corpo fu ritenuto da molti una teoria improponibile e ci volle un lungo percorso di evoluzione culturale per poter, in primo luogo, convincere dell’esistenza dei germi, e in secondo luogo, persuadere che la prevenzione consisteva nell’iniezione del virus stesso (inoculazione e vaccinazione), idea ritenuta quantomeno paradossale.

Le misure prese per contenere le epidemie sono, ancora oggi, molto simili a quelle del passato; fu la Repubblica di Venezia ad elaborare il concetto di quarantena, lazzaretti e disinfezione dei beni e delle merci (anche se in maniera piuttosto grossolana) e ad istituire le prime autorità sanitarie. Ciò che abbiamo attualmente nella nostra società riflette largamente queste stesse misure nate nel Medioevo, a Venezia, durante la peste. Se da una parte si può affermare che, l’essere state usate per così tanti secoli è una dimostrazione della loro validità, dall’altra si può anche contestare che questa stessa caratteristica sia un segnale della scarsa capacità di studio e preparazione di un piano efficiente e ben strutturato da parte dei governi nell’affrontare le epidemie, essendo che i metodi impiegati si basano sulla falsariga di quelli medievali. Con questo presupposto in mente, ho analizzato sia l’efficienza delle misure di contenimento delle epidemie precedenti alla teoria dei germi, che quelle adottate dopo la scoperta degli stessi - prendendo in esame, in quest’ultimo caso, alcune tra le grandi epidemie che hanno afflitto l’Europa: vaiolo, colera (e sifilide). Ho rilevato che la scoperta dei germi, in concomitanza con queste epidemie, spinse gli stati non solo a proteggersi da queste ma anche a fare un passo in più: a prevenire. Il vaiolo è il protagonista dell’enorme balzo scientifico che ha introdotto la pratica della vaccinazione, mentre il colera fu il promotore del miglioramento se non la fonte di stimolo alla creazione vera e propria di infrastrutture idriche nella Londra del XIX secolo. Infine, ho analizzato le misure adottate nell’ultimo anno (2020) durante la prima ondata di COVID-19, rilevando l’importanza del

ruolo dell'Unione Europea e quindi della collaborazione tra stati, già avviatasi durante l'epidemia di colera.

Le reazioni che le epidemie hanno scatenato hanno una grande rilevanza nella mia analisi complessiva. Si nota, spesso, un divario tra l'applicazione delle misure dello Stato e l'accettazione delle stesse da parte del singolo; uno degli epicentri di questo approccio è la mancanza di dialogo tra lo Stato e la popolazione. Ho scelto di analizzare la visione della popolazione principalmente sulle epidemie in sé; se nel Medioevo e prima della teoria dei germi la superstizione, i "peccati" - quindi anche la ricerca di un capro espiatorio - e il folklore tenevano le redini, dopo la scoperta dei virus le reazioni si basavano ancora molto sulla ricerca di un capro espiatorio, ma a questo si aggiunse anche il concetto di razzismo vero e proprio e discriminazione, e i primi movimenti no-vax basati sulla diffidenza della scienza e delle misure governative. Con l'epidemia di COVID-19 ho osservato come, ancora una volta, le reazioni delle persone si sono evolute: si riaffermano la ricerca di un colpevole ed episodi di razzismo, a cui però si sono aggiunti negazionismo, teorie cospirative contro il governo e il "sistema" e movimenti contro i vaccini e contro l'obbligo di indossare la mascherina, traducibili in diffidenza nei confronti della scienza, del governo e del "prossimo".

Il primo capitolo fornisce una visione d'insieme e i concetti base per poter comprendere al meglio i successivi capitoli. In prima istanza è stato necessario chiarire la differenza tra endemico, focolaio, epidemia e pandemia. Il primo termine è traducibile come "tipico di", ad esempio quando si parla di malaria si può affermare che questa è endemica nei paesi tropicali. I successivi concetti invece sono interpretabili come un'unità di misura di diffusione di una malattia; l'unità più piccola è il "focolaio", che indica una diffusione solitamente piuttosto circoscritta. Una "epidemia" indica che un focolaio si è allargato su scala regionale e/o nazionale; l'unità più grande è la "pandemia", la quale indica un'epidemia che si è estesa oltre i confini regionali/nazionali e oramai interessa anche altri continenti. In secondo luogo, ho chiarito la differenza tra medico, speziale e cerusico: si tratta delle tre figure medievali che operavano nell'ambito sanitario, a ciascuna venivano attribuiti diversi prestigii e competenze. Il medico era colui che, avendo studiato all'università, era in grado di dispensare raccomandazioni e prescrivere medicazioni. Era considerato il conoscitore della vera

disciplina medica. Lo speziale, invece, era colui che forniva le medicazioni; infine, il cerusico era la figura che possedeva le capacità tecniche di operare e manipolare il corpo umano. Non essendo però un accademico, veniva spesso sottovalutato e il rapporto tra medici e cerusici era piuttosto conflittuale. Successivamente ho spiegato le cinque teorie riguardanti le ipotesi sull'origine delle malattie ed epidemie: fino al XIX secolo, si brancolava ancora nel buio per quanto riguarda la loro origine, perciò vennero formulate diverse teorie. La prima è quella che si basava sulla convinzione che la causa fossero divinità soprannaturali, un dio o un'entità maligna, aveva quindi come epicentro la religione e la spiritualità. La seconda è la teoria umorale, derivante dai trattati di Ippocrate, secondo la quale un corpo sano è costituito dall'equilibrio dei quattro umori che lo compongono, ossia bile nera, bile gialla, flegma e sangue. La terza costituisce una fase di transizione tra quella umorale e la successiva (la miasmatica): si tratta della teoria del contagio, accennata da Galeno ma mai portata avanti. La quarta teoria invece affermava che le malattie fossero causate dai "miasmi" rilasciati dall'aria e dal suolo. L'ultima teoria delle malattie è la teoria dei germi, applicata ancor oggi, secondo la quale le malattie sono causate da esseri microscopici chiamati germi. Emerse grazie al ruolo della scienza che iniziò a diventare centrale nella società. È la prima teoria ad appoggiarsi alla scienza empirica.

Successivamente, nel primo capitolo ho inserito dei concetti legati alla popolazione, demografia ed epidemia. In primis ho spiegato la strategia vitale dell'essere umano, la "K", che si caratterizza per una prole limitata per la quale, per ogni individuo, il genitore investe tempo ed energia, che si contrappone alla strategia "r", tipica di insetti, pesci, uccelli e piccoli mammiferi, con basso tasso di sopravvivenza. In passato le famiglie erano tuttavia molto numerose a causa del basso fattore di sopravvivenza, ma oggi è possibile affermare che la razza umana è resiliente ed è riuscita ad affrontare le condizioni ambientali più difficili attraverso invenzioni scientifiche e scoperte che hanno limitato e/o posto fine alle epidemie. La demografia europea, nella storia, ha avuto tre ondate di crisi ed espansione, causate da "forze di costrizione" di cui fanno parte le patologie. Esse hanno iniziato a rappresentare un problema dal momento in cui l'uomo è diventato sedentario. La sedentarietà ha creato un ambiente favorevole allo sviluppo delle epidemie a causa di: alta densità di popolazione, ambiente favorevole

ai parassiti, stoccaggio dell'acqua, allevamento. Le epidemie come forza di costrizione furono la causa dello sterminio quasi totale delle popolazioni native americane, per effetto del "suolo vergine". Ho concluso questo capitolo con il modello Malthusiano di crescita della popolazione: essenzialmente, la popolazione cresce fino a che un cosiddetto "freno positivo" (guerra, carestia, epidemia) la riporta ad un livello che sia proporzionale alle risorse disponibili. Il modello di Malthus, tuttavia, non tiene conto di determinate variabili, ad esempio l'eventualità di un progresso scientifico che possa rallentare e ritardare la diffusione di malattie infettive, che è ciò che ha luogo dopo la scoperta dei virus e che analizzo nel capitolo 2.

Il capitolo 2 analizza le epidemie del passato, confrontando le prime misure di contenimento e le reazioni delle persone. Per prima cosa ho identificato i momenti storici del passaggio dalle epidemie a vere e proprie pandemie: in primis le rivoluzioni agricole, che hanno portato a scambi di malattie tra animali ed esseri umani, e le rivoluzioni industriali, che hanno causato lo spostamento e insediamento in massa di gruppi di persone. Il secondo fattore è da attribuire alle grandi scoperte geografiche con lo "scambio colombiano", che portò al passaggio di patogeni da un continente all'altro. Dopo questa introduzione, sono passata alle misure di contenimento delle epidemie in Europa prima della scoperta della teoria dei germi. Ho iniziato questo argomento con il chiaro presupposto che prima della scoperta dei virus la teoria miasmatica e degli umori predominavano. La scienza non possedeva gli strumenti avanzati e le competenze che sarebbero emerse alla fine del XIX secolo. Le autorità erano le gilde e i magistrati sanitari. Rappresentano le prime autorità che sono state in grado di imporre le loro decisioni in materia sanitaria alla popolazione Europea. Si deve molto alla Repubblica di Venezia per quanto riguarda l'invenzione delle prime misure di contenimento delle epidemie, la quale si trovò costretta ad intervenire per cercare di limitare la strage che la peste stava provocando. Una prima ed efficace misura, fu la quarantena marittima, che si appoggiava ai lazzeretti, che a loro volta costituivano la quarantena della terraferma. Costituiscono anche la prima forma di isolamento sociale. Una seconda misura, di cui anche Venezia fu pioniera, sono i cordoni sanitari: barriere militari con torri, fortezze e posti di osservazione. Nei lazzeretti, istituzioni quantomeno controverse, ci si occupava sia dei malati e degli individui in quarantena che delle merci che arrivavano a Venezia

tramite nave. Il governo si appoggiava anche a gruppi di cittadini che operavano all'interno della città; ci furono sia episodi di spionaggio sanitario che processi per negligenza all'interno dei lazzaretti. Tutte queste misure dimostrano che, nonostante la popolazione e le autorità erano in quotidiano contrasto, un sistema sanitario pubblico pseudo-efficiente era stato creato: il ruolo dello stato moderno, almeno nei paesi occidentali, iniziò ad affermarsi imponendo decisioni alla popolazione appoggiandosi alla coercizione militare per implementarle e farle rispettare.

Il secondo capitolo si concentra poi sulle misure sanitarie post scoperta dei virus. La mortalità iniziò lentamente a diminuire grazie alle innovazioni scientifiche e tecnologiche del XVIII e XIX secolo. Ho analizzato i cambiamenti prendendo in esame tre grandi epidemie. La prima, l'epidemia di vaiolo, fu la prima malattia ad essere eradicata completamente dalla società (grazie alle scoperte di Jenner) ed anche la prima per la quale si effettuò una campagna di vaccinazione di massa, lanciata dall'Organizzazione Mondiale della Sanità. Fu usata in passato con i nativi americani come arma biologica per ridurre ed indebolire la popolazione, e ancor oggi si teme che alcuni stati ne conservino delle scorte per lo stesso scopo. La seconda epidemia che ho preso in esame è quella di colera; grazie agli esperimenti e studi di diversi scienziati in particolare Pasteur, Lister, Koch e l'italiano Pacini, si scoprì finalmente che le malattie avevano origine nei virus, e non dai miasmi. A Londra John Snow scoprì che le epidemie londinesi di colera erano ad attribuirsi ad una pompa d'acqua in particolare; questa scoperta fu promotrice di una serie di decisioni che portarono alla creazione di infrastrutture idriche. Nacquero le prime regolamentazioni internazionali di quarantena per evitare la diffusione del colera a livello internazionale, mentre attualmente sono in corso campagne di vaccinazioni nei paesi colpiti da epidemie di colera. La terza e ultima malattia che ho preso in esame è la sifilide, incognita per molti aspetti: può rimanere latente dai tre ai trent'anni, veniva spesso confusa con altre malattie (per questo soprannominata "la grande imitatrice"). Infine la sua origine è dibattuta, venne chiamata ad esempio il male francese, spagnolo, cantonese a seconda del luogo in cui si manifestava. Una sua peculiarità nella sua manifestazione è che può portare alla pazzia, per questo motivo è possibile sospettare che la sua azione abbia potuto influenzare le menti di alcuni grandi leader del passato (ad esempio Enrico VIII), portando a reazioni a

catena che potrebbero aver influenzato il destino dell'intera Europa. Attualmente è la seconda causa di morte prematura nei neonati, sulla quale stanno attualmente operando l'OMS e UNICEF.

Infine, il secondo capitolo si concentra sulle reazioni delle persone alle epidemie, divise tra pre- e post-teoria dei germi. Nel primo caso, la popolazione attribuiva le cause delle epidemie (nel caso specifico la peste) a capri espiatori, credenze e religione. Si pensava che spiriti maligni, che si manifestavano tramite possessioni demoniache, potessero infettare gli individui; allo stesso modo, dio infliggeva la peste per punire i peccatori. In entrambi i casi singoli individui e gruppi di persone venivano presi di mira, torturati e giustiziati per poter "scacciare" la peste. In questo periodo si diffonde anche il fenomeno degli "untori", sfruttato, talvolta, anche dal punto di vista politico. Complessivamente, erano reazioni strettamente legate all'ambito religioso, a tal punto che il terrore scatenato dalla peste combinato alla religiosità della società diede vita a veri e propri culti, come quello dei santi, delle reliquie e il movimento dei Flagellanti. Le credenze popolari attribuivano poteri di guarigione a determinate figure popolari, mentre il folklore si riferiva a draghi della peste sconfitti dai santi. Infine, era comune ritenere che determinati indumenti e accessori possedessero delle proprietà magiche o fossero in grado di respingere le "particelle di peste". Fu in questo periodo che si diffuse il costume del dottore della peste veneziano, completo di un lungo naso per tenere a distanza in caso di contagio.

Dopo la scoperta dei germi, le reazioni furono di paura e diffidenza nei confronti della scienza epidemiologica e di protesta nel confronto della pratica della vaccinazione: se infatti le malattie erano una punizione divina, l'inoculazione significava un'interferenza con la volontà di Dio, a cui si aggiungeva l'influenza delle convinzioni popolari guidate dall'ignoranza che impedivano alle persone di avere fiducia nell'efficacia del vaccino. Infine, i vaccini e il personale medico che si occupavano delle classi più povere erano l'uno di scarsa qualità, l'altro poco preparato. Un'altra reazione fu quella della ricerca di un colpevole, per il quale ho preso l'esempio del colera: una crepa nel perfetto modello società occidentale, proveniente da una civiltà "sottosviluppata", con un decorso veloce che degradava la dignità della persona. Il colera, colpendo maggiormente le classi più povere, risaltò la divisione della società tra

poveri e ricchi dando origine a due reazioni contrapposte: i poveri sostenevano che i ricchi li stessero avvelenando, mentre i ricchi incolpavano i poveri di aver attirato loro stessi questa piaga sulle proprie famiglie, a causa della loro natura incivile e del loro modo di vivere. Riemerse la paura e il fenomeno degli “untori”, generando un clima teso che portò ad antagonismo specialmente nei confronti delle classi più abbienti, del governo e della classe medica. La terza reazione post-scoperta dei virus è quella di razzismo e discriminazione; prendendo il caso della sifilide, essa viene associata all’immoralità, soprattutto perché, in passato, non c’era una distinzione immediata tra venerea e non venerea. La *Church Mission Society* londinese si fece carico di “modernizzare” i popoli africani, in particolare in Uganda; i missionari osservarono le epidemie di sifilide e le attribuirono all’arretratezza e alle loro tradizioni (si praticava la poligamia e il politeismo), che, secondo i missionari occidentali portavano alla collera divina e alla conseguente diffusione di epidemie come conseguenza. L’unica cura che poteva fermare le epidemie di sifilide era l’occidentalizzazione.

Il terzo capitolo si occupa della attuale pandemia di COVID-19. Il virus avrebbe origine in un *wet market* di Wuhan, in Cina, ed è arrivato in Europa a fine gennaio 2020. Ho analizzato la risposta europea messa in atto durante la prima ondata (24 gennaio-15 giugno 2020), e ho rilevato le tre azioni principali messe in atto dall’Unione Europea che ne dimostrano l’efficienza e il coordinamento. La prima operazione è il meccanismo integrato di risposta politica alle crisi, che ha ricoperto un ruolo fondamentale nella protezione della popolazione civile rimpatriata durante la prima ondata e nella creazione del fondo comune *RescEU*. La seconda azione consiste nello stanziamento di fondi da parte della Commissione Europea Commissione nel campo della ricerca scientifica e sanitaria e aiuti ed agevolazioni alle piccole e medie imprese. La terza consiste nel processo di educazione della popolazione e diffusione di informazioni riguardo alla pandemia di COVID-19 tramite i social network, in particolare Facebook e YouTube, iniziativa a cui partecipano attivamente sia le organizzazioni internazionali che i social stessi.

Le misure in Italia si sono basate sulla “strategia” dei DPCM, che hanno suscitato numerosi dibattiti in quanto vengono emanati dal Presidente del Consiglio dei Ministri senza consultare il Parlamento, i ministri e l’opposizione. Oltre ad esserne stato

contestato il grande numero emanato, essi pongono dei limiti alle libertà sancite dalla Costituzione stessa. Il Ministero della Salute, il Dipartimento della Protezione Civile e l'Istituto Nazionale di Sanità si sono impegnati per il contrasto della disinformazione e la diffusione di informazioni corrette e raccomandazioni tramite i canali ufficiali, YouTube e i social network, dove viene promosso l'hashtag *#iorestoacasa*. Sono state anche approvate delle iniziative in forma virtuale tra cui "chiedi all'esperto" e dei Webinar. L'Italia è stata la prima nazione ad introdurre la distanza sociale per contrastare il Covid, nonché pioniera anche dell'isolamento e della quarantena in Europa. Sono state diffuse delle linee guida riguardo il comportamento da adottare anche sul posto di lavoro, mentre i DPCM hanno regolato il comportamento da assumere nei luoghi pubblici e in caso di contagio (o sospetto) da Covid. Infine, le strutture sanitarie stesse hanno risentito particolarmente della crisi, in quanto non sono state concepite sulla previsione di possibili epidemie o pandemie; tendenzialmente le si associa ad elementi che appartengono al passato o ai paesi più poveri. Mentre la politica è stata grado di reagire in tempi relativamente brevi, le infrastrutture e la forza lavoro non hanno potuto essere adattate alla nuova situazione con altrettanta facilità. Le soluzioni a cui si è ricorsi sono state l'ausilio dell'esercito, dei militari e dei mezzi in dotazione, e l'ampliamento/apertura di reparti ospedalieri specifici e/o aumento posti letto in terapia intensiva.

Nel capitolo 3, infine, mi sono concentrata sulle reazioni delle persone al COVID-19 e alle misure governative, focalizzandomi in particolare sull'Italia. La paura verso il nuovo virus ha dato origine a teorie e complotti bizzarri, nonché a movimenti contro le misure obbligatorie per il contenimento del Covid. In primo luogo, il negazionismo e teorie cospirative, che ho potuto osservare analizzando video su YouTube e siti web: la *Marcia della Liberazione* e tre esponenti italiani del negazionismo (Fiore, Castellino e Cunial) e le seguenti teorie cospirative: il "nuovo ordine mondiale", la teoria secondo la quale Bill Gates starebbe cercando di ridurre la popolazione mondiale rendendola sterile tramite i vaccini, il complotto secondo il quale il 5G diffonderebbe il Covid e, infine, l'ipotesi per la quale i vaccini sarebbero un pretesto per applicare un microchip/tatuaggio "speciale" sulla pelle che sarebbe in grado di controllare la vita delle persone, annullandone la privacy. In secondo luogo, si sono diffusi movimenti no-

mask e no-vax, i primi si oppongono all'obbligo dell'uso della mascherina perché ritenuta pericolosa per la salute, i secondi si oppongono ad un possibile obbligo vaccinale per lo stesso motivo, ossia la salute: il timore di sviluppare l'autismo (frutto di una ricerca poi confutata), di subire una "ricombinazione genetica" a causa dei vaccini a mRNA (la particella di RNA si dissolve nel corpo senza provocare danni di questo tipo) e infine di iniettarsi particelle di metalli pesanti (solo alcuni sono presenti in quantità così ridotte da non causare un pericolo per la salute). L'opposizione ai vaccini si basa anche sulla convinzione che nella soluzione che viene iniettata si trovino anche parti di feti abortiti, anche se in realtà si tratta di semplici linee cellulari.

Molte di queste teorie e convinzioni che alimentano le reazioni delle persone si basano su informazioni manipolate o interpretate e comunicate in maniera scorretta, una colpa attribuibile a "leader" virtuali che riescono ad accattivarsi l'attenzione grazie alla loro capacità di suscitare sentimenti "semplici", come l'indignazione e la frustrazione. Tra questi leader troviamo molti politici, che ho definito politici-influencer, che hanno un ruolo di particolare rilevanza soprattutto per quanto riguarda il terzo "tipo" di reazioni al Covid: la ricerca di un capro espiatorio e il razzismo. Come nel passato, si ha sempre cercato di attribuire la colpa a qualcuno per lo scoppio di un'epidemia e, nel caso del COVID-19, è stato ipotizzato che si trattasse di un virus creato oppure "scappato" da un laboratorio dalla Cina/Russia/America. Molti studi hanno confutato l'ipotesi, ribadendo che si tratta di un virus che non è stato né creato in laboratorio né manipolato ("bioingegnerizzato"). Si sono diffusi anche episodi di razzismo nei confronti di cittadini cinesi o asiatici in generale, che sono stati insultati, oltraggiati e discriminati in numerosi casi in tutto il mondo, sia bambini che adulti. Determinati politici-influencer hanno avuto un ruolo particolarmente rilevante in questo ambito, pubblicando post nei social network che hanno suscitato rabbia e rancore nei loro follower, alimentando così un odio già presente e latente nella società. Gli atteggiamenti di condanna nei confronti del governo e della scienza, combinati agli episodi di razzismo e discriminazione, possono essere definiti una forma contemporanea di identificazione di "untori".

Il mondo e il corso della storia sono stati largamente influenzati dalle epidemie, che proprio per la loro importanza dovrebbero essere analizzate separatamente come

motore e promotore di molti cambiamenti storici. Le epidemie sono state promotrici del progresso scientifico e culturale e, quando hanno cessato di rappresentare un mistero grazie alle scoperte scientifiche, le aspettative di vita hanno iniziato a crescere. Le epidemie non solo hanno incoraggiato il progresso e lo sviluppo strutturale dello Stato, ma anche quello culturale e legato alla mentalità di massa. La scienza epidemiologica ha segnato il passaggio dalle credenze alla verità empirica, dalle ipotesi alle certezze e dalla paura alla speranza. Nonostante molti cambiamenti positivi soprattutto nel campo delle decisioni politiche e della collaborazione internazionale, dal punto di vista delle reazioni delle persone c'è ancora molta strada da fare. La mentalità contemporanea è ancora legata alla ricerca ed individuazione di presunti untori, ovvero individui a cui si possa attribuire interamente la colpa e la responsabilità - nel caso specifico della mia tesi - dello scoppio di epidemie e pandemie. Questo accanimento rivela una società che necessita non solo di una valvola di sfogo, ma anche di determinate certezze: la certezza che determinati fenomeni dannosi sono imputabili a specifici individui. In questo modo, si identifica un punto di partenza per quanto riguarda la punizione dei responsabili, che una volta fermati non possono fare più del male alla società e di conseguenza nemmeno diffondere le epidemie.

Un ulteriore problema che ho rilevato durante la mia analisi, è che la nuova realtà virtuale di internet non incoraggia il dialogo tra governi e scienza rispetto alla popolazione, soprattutto a causa della diffusione di disinformazione e fake news e dell'azione di influencer politici. Tuttavia, le istituzioni e le organizzazioni ufficiali stanno combattendo incessantemente questi fenomeni e le campagne di informazione continuano senza sosta attraverso tutti i media: TV, radio, Internet. Il lavoro che si prospetta più intenso riguarda il dialogo tra governo e popolazione. Le campagne di informazione non dovrebbero solo fornire prove fattuali neutre, ma anche lavorare sulle paure della popolazione: sono quelle, infatti, che innescano reazioni bizzarre e che spesso possono risultare in comportamenti violenti, dannosi e discriminatori.

INTRODUCTION

“A great part of our civilized life depends upon the addition of amenities, the comforts and the pleasures which make a man’s existence not only tolerable but happy” (Cartwright, 1991: 218).

Human history has a wide chapter that includes diseases, as they have affected humanity silently and inexorably. They are silent and invisible actors that operate in the background, creating a series of chain reactions that sometimes get out of control and lead to catastrophes.

This Master’s Degree thesis deals with the issue of epidemics along history, in particular the reactions of the governments and the reaction of its population to the illness, divided in the period before and after the discovery of germs. I have chosen this topic as, very often, history revolves around the changes brought about by economic, industrial, agricultural and technological factors combined with social changes. Epidemics, however, ever since humanity became more sedentary, have always played a huge part in the history of the world, shaping the course of events. Illnesses are indeed silent and invisible actors of history, and they have the capacity of influencing every field of humanity during and after violent outbreaks. They have the capacity to bring down the society and its structure, forcing everyone to rearrange their priorities, as sickness blurs out every capacity of the society to progress or, simply, carry on with every-day business. Epidemics left trails of destruction, death and weakness; however, in a sense, sometimes they had positive effects on the progress of society especially in terms of scientific progress, infrastructures, technology and cooperation between states and regions. We will see how science efficiently progressed in the battles against ailments, moving from ancient cures that had no scientific base to the modern and more efficient medicine. We will also see how the violent outbreaks of cholera triggered the development of modern infrastructure in order to stop the infection. Moreover, we will observe technologic improvements dictated by the recent necessity of working and studying from home due to COVID-19 pandemic. Lastly, we will notice how epidemics gave birth to a common necessity of collaboration that sometimes turned into solidarity between states. I am convinced that if the community can enjoy improvements reached

in the 21st century, much is owed to the reactions that epidemics triggered and still trigger in private and public subjects.

My dissertation revolves around two aims. Firstly, I want to explore the ways in which Europe found itself - as one could say - backed into a corner. The very first measures, born after the epidemics of plague of the middle ages, show its first attempt to protect itself. It was still not clear what the cause of illnesses was, but as we will see some subjects had crucial intuitions. The first measure and system to contain epidemics were put into place by the Republic of Venice, who seems to be the one that went closer to a concept of "contagion". These measures were imitated also after the discovery of germs. My second aim is to "put into the other's shoes". I have personally found the collectivity's evolution in beliefs and mentality in coping with epidemics outstanding. As we will observe, before the germ theory the reactions were rooted in ignorance and fear and were strictly linked with beliefs, religion and folklore. After the discovery of viruses, the reactions were still fuelled by ignorance and fear but also by distrust of science. We will see how much the population's convictions have changed, and the evolution in the ways to cope with an epidemic.

I have picked both printed and online sources. The printed sources mainly embrace the history of epidemics and of illnesses, whereas I used websites especially for the 3rd chapter - being COVID-19 epidemic very recent and constantly updated. I was able to integrate some scientific research as well, in order to talk about the origin and the symptoms of the epidemics and to disprove some of the beliefs and conspiracy theories that involved the scientific area. My dissertation is structured in three chapters: the first provides basic information, the second focuses on the illnesses in the past and the third on the current pandemic of COVID-19.

In this thesis I have provided an investigation of my topic by starting off with an introductory chapter. Chapter 1 will in fact handle the basic concepts that are indispensable in order to catch up with chapters 2 and 3. First of all, chapter 1.1 will explain the difference between endemic, outbreak, epidemic and pandemic and between physician, apothecary and surgeon. Secondly, in 1.2 we will move to the five interpretations of diseases in the past, namely the supernatural, humor, contagion,

miasma and germ theory - the latter being the one that is still applied nowadays with COVID-19 pandemic. Chapter 1.3 will analyze the interactions demography-populations-epidemics, namely an overview about how demography interacts with the spreading of diseases, disease as a constraint force and its effect in the Old and New World (starting from the Columbian Exchange), a brief digression into the vital strategies adopted by living beings and the very starting point/the trigger of epidemics, i.e. when man became sedentary. Lastly, in 1.4 we will explore some basic concepts related to the Malthusian Model and the interaction constraint forces - population.

Chapter 2 will be concerned with the exploration of illnesses in the past. It will start off by explaining, in 2.1, the shift from the concept of "epidemics" to "pandemics" through two steps: the agricultural and industrial revolutions and the great explorations, both involving sedentarity and the encounter of different populations with the Columbian Exchange who were not immune to new viruses. 2.2 will be focused on the first health authorities (guilds and health magistrates) and health measures in Europe before the germ theory, highlighting the prominent role of the Republic of Venice - sea and land based quarantine, the first techniques of decontamination, the constant and hierarchical controls to prevent outbursts. 2.3 will explain the improvements regarding the epidemics measures that led to a modern decline in mortality, by following the developments of three epidemics (including the problem they represent nowadays) - smallpox and the invention of vaccinations, cholera and the development of water infrastructure, syphilis and its influence on leaders. Lastly, chapter 2.4 will be dedicated to the reactions of people to epidemics. The first part will talk of the reactions that characterized Europe before the germ theory, namely the role of sins, garments and folk medication, superstitions, plague cults and religion. The second part concerns the reactions that characterized the European population post germs discovery, that is the first no-vax movements, scapegoating, racism, and discrimination.

Chapter 3 is dedicated to the contemporary struggle against the pandemic of COVID-19. Section 3.1 will be a brief introduction about the origin of COVID-19 and, after this brief introduction, chapter 3.2 will be focused on the arrival of this pandemic to Europe and the measures taken and will be divided in two parts. Firstly, in 3.2.1 I will talk of the four main actions implemented on the European level that, in my opinion,

demonstrate the efficiency of the European Union's solidarity and coordination, namely the protection of civil population and the institution of the first European stockpile - *RescEU* - , the allocation of funds within EU and the education and limitation of harmful content on the internet section. Secondly, in 3.2.2 I will talk about the case of Italy and how the Covid crisis was handled, being Italy the first country in Europe to endure complications. I will focus on the DPCM issued by the President of the Council of Ministers and the debate that arose. Successively, I will dedicate a paragraph to the health communication portals dedicated to approved updates on COVID-19, the implementation of physical distancing, isolation, quarantine and the weight that Covid had on healthcare services, namely infrastructure and workforce. Finally, I will add a conclusion to both 3.2.1 and 3.2.2 with my considerations on the issues. Next, chapter 3.3 will be focused on the reactions of people to the pandemic of COVID-19. I will investigate the theories that emerged hand in hand with the pandemic, particularly prominent in the virtual world but that, at times, translate into the "real life" as well for instance by means of protests. I will investigate the phenomenon of Covid negationism, the conspiracy theories, no-vax and no-mask movements and lastly the search for a scapegoat and racism that emerged during this health emergency. We will see the similarities and differences with the reactions in the past.

CHAPTER 1

BACKGROUND INFORMATION

In order to discuss the history of epidemics it is necessary to provide the fundamental information to explain some basic concepts. First of all, we will clarify the difference between endemic, outbreak, epidemic and pandemic, to not wrongly use them interchangeably. In fact, even though they refer to the same main issue, they have different meanings that are important to note when they are then applied to demography. We will do the same by defining physician, apothecary and surgeon.

Secondly, this chapter will go through the interpretation of diseases in the past. Five different theories were elaborated during the centuries: supernatural theory of diseases, theory of humor, miasma theory, theory of contagion, germ theory. Before the elaboration of the last one, two or more could interact with one another during specific periods of time. It is necessary to introduce them as they were applied in the past during the outbreak of epidemics, in order to understand the causes and contrast them. This insight will be resumed in chapter 2 in order to provide a thorough framework of the case-studies. While discussing the theories, as previously mentioned one can notice that the analysis does not follow a strict chronological order. In fact, through the centuries the theories persistently overlapped, expired and reappeared, often - seemingly - without following a specific logic. Religion, government and even fashion play a great role in what theory is given more credit in a specific time, however these three are themselves also very inconstant variables¹.

Thirdly, this chapter will give an insight of demography and the interaction with epidemics and population rise/fall up until the early modern period. This section is important as we are going to see how animals and humanity differentiate in terms of survival strategies. Moving on, we will study the concept of disease as a constraint force that acts from the outside, containing and rebalancing the number of the population when the latter reaches its peak. Next, we will see how sedentarity is possibly the main

¹ The specificity about how the theories were applied in the different case-studies and periods of time will be analyzed in the later chapters.

constituent that creates a fertile ground for epidemics, the one that also led to the decimation of the Native American population, also because of their immunologically-naïve characteristic. Finally, we will briefly move our focus onto the so-called Malthusian model of population growth, which provides an explanation about the reason why resources and a constant rise of population density are two irreconcilable concepts.

1.1 Basic concepts

1.1.1 Endemic - Outbreak - Epidemic - Pandemic

When talking about diseases, the four most widely used terms are endemic, outbreak, epidemic and pandemic. They are prone to be used interchangeably - however, although they refer to the same subject, they carry a different shade of meaning. They indicate the expansion and width of something (i.e. a disease).

Among the four terms, “endemic” and “outbreak” are the ones with a closer connection. The term “endemic” indicates a characteristic that is specific for a certain territory. Thus, referring to a pathology, it signifies that the latter has a constant presence/is permanent/is typical of a specific territory². The Utah-based non-profit hospital system of Intermountain Healthcare further specifies that it belongs to a particular group of persons. For this reason, it is commonly said that “X is endemic to Y” - e.g., “malaria is endemic to tropical areas”. It is thus possible to conclude that an endemic is very specifically-located and typical of a group of people or of a very delimited area. A rough translation can be “typical of”.

Secondly, an “outbreak” is a more severe extension of the number of endemic cases³. The intrinsic meaning of the word indicates an unexpected event that happens with no prior notice. In fact, an out-of-the-context synonym for outbreak can be explosion or breaking out - an explosion is a sudden occurrence that takes place

² <https://www.treccani.it/vocabolario/endemico/>

³ <https://intermountainhealthcare.org/blogs/topics/live-well/2020/04/whats-the-difference-between-a-pandemic-an-epidemic-endemic-and-an-outbreak/>. This organization includes 2.400 physicians and 160 clinics. Twenty-four hospitals are part of this system and they offer a number of health services.

unexpectedly, and one is usually unprepared. In the context of epidemiology, it is defined “outbreak” in four situations: “if it’s unknown, if it’s new to a community, [...] if it’s been absent from a population for a long time⁴” and if it is an increase in cases that occurs all of a sudden and in a different area.

Moving forward to the third term, the word “epidemic” is composed of the Greek prefix *epi-* that means “on, upon, near, at”. Applying it to the case of illnesses, it is possible to conclude that said prefix widens the range of the area affected by the illness, including areas or populations “near(by)”. An epidemic is thus not a disease that is typical of a place or a group of people anymore. It moved beyond these borders, conditioning populations or areas nearby. Following the definition of the WHO, an epidemic is an illness that:

“[...] clearly [strikes] in excess of normal expectancy. The community or region and the period in which the cases occur are specified precisely. The number of cases indicating the presence of an epidemic varies according to the agent, size, and type of population exposed, previous experience or lack of exposure to the disease, and time and place of occurrence.⁵”

Fundamentally, an illness is defined as an “outbreak” when it affects people beyond a certain limit and is not common or permanent in a given area. The most important point to underline is that it occurs at regional or community level.

Lastly, the term “pandemic”, which is the most used in the last months. According to the definition of WHO a pandemic is “the worldwide spread of a new disease⁶”. The literal meaning can also be extrapolated from its prefix, akin to what we have done with the previous term. *Pan-* has a Greek origin and it means “all, entirely”. Thus, if an illness becomes pandemic, it signifies that it spread over more than one country, continent or across the entire world. In chapter 3 Covid-19 will be taken as case-study as the most recent pandemic that has affected the world.

⁴ <https://www.webmd.com/cold-and-flu/what-are-epidemics-pandemics-outbreaks#1>

⁵ <https://www.who.int/hac/about/definitions/en/>

⁶ https://www.who.int/csr/disease/swineflu/frequently_asked_questions/pandemic/en/

1.1.2 Physician - apothecary - surgeon

Nowadays medicine is a profession which is highly professionalized and requires a large knowledge and skills. However, by the mid-16th century, the field of medicine comprised three professional figures: physician, apothecary, surgeon. Each of them had their own knowledge, duties and legally defined rights. These figures were part and themselves constituted the so-called discipline of proper medicine. The substantial differences consisted in their tasks and skills:

“Physicians advised and prescribed medications, apothecaries compounded and dispensed those remedies, and surgeons performed all physical intervention from bloodletting to amputation.” (Booth, 2018)

The three categories contrasted, although their boundaries were not well-defined. They were full-fledged the ancestors of today’s doctors. Traditionally, physicians would be the only ones who practiced learned medicine and, in order to obtain their title, university education (that emphasized ancient Hippocratic techniques) was required. Because of this criterion, there were very few physicians in comparison to the other medical figures. Besides caring for the person’s mental, moral and physical needs they were specialized in multidisciplinary studies: they were educated on philosophy, geometry, mathematics, astronomy, astrology and music. They would provide a very personal “healthcare package”, that differed from individual to individual, according to the pre-Enlightenment Hippocratic medical traditions (Booth, 2018).

Moving forward, the second professional figure were the pharmacists (or apothecaries), who disposed of remedies and medications prescribed and advised by physicians. Up until the 18th century the same individual would practice both medical and non-medical trades, therefore the medical activity constituted only a part of their entrance. This was especially true for apothecaries who, e.g. in Italy, would have regular customers, for instance ill people, doctors and even painters. Pharmacists shall not be mixed with common charlatans who attempted to copy apothecaries, claiming to possess the “Gift”, whose aim was mostly create a position in society for themselves,

taking advantage of the mass that would prefer them as they considered them more familiar and closer to them⁷.

Thirdly, the medical practitioners included the figure of the surgeon (a “non-learned” practitioner), or barber-surgeon. Just like the apothecary, the surgeon could be - however not necessarily - a barber. Their apprenticeship emphasized manual techniques. As a matter of fact, they would be able to amputate a leg within minutes, stitch and seal around fifty arteries and veins and prevent the excessive bleeding by covering the stump with pig skin to protect the wound. Nevertheless, despite their skills, they would still be given low consideration compared to apothecaries and physicians due to their scarce theoretical knowledge. Arguably due to their constant proximity to bodily fluids, during the time of Henry VIII surgeons would be named buffoons, charlatans, “jacks of all trades” in the popular press⁸. Moreover, their patients would tendentially die of infection (which was erroneously thought to generate spontaneously), despite perhaps the surgery being a successful one. The role, importance and success of surgeons was redefined after the 19th century thanks to the discovery of germs. Anaesthesia was introduced and to avoid “collateral damage” Joseph Lister (1827-1912) introduced the sterilization of hands, instruments and air surrounding the patient⁹.

1.2 Interpretation of diseases in the past

Until the 19th century, scientists and physicians were groping in the dark about the causation of illnesses, and several theories about the origin of diseases and epidemics were advanced. Cures and researches based on “scientific medicine” were not always considered along the centuries. In accordance with the era, scientific progress and popular beliefs different conjectures arose. Each tried to find an answer to the question about what the cause of diseases is and how to stop (or prevent) them. They featured

⁷ See chapter 2.4.1, letter c).

⁸ <https://hrpprodsa.blob.core.windows.net/hrp-prod-container/11727/elizabethhurrenfinal.pdf>

⁹ See chapter 1.2.5.

singular mixes of science, spirituality and culture, and blamed tangible and intangible issues, such as supernatural forces, the environment, the air and so forth.

1.2.1 Supernatural theory of diseases

The first theory consists in the supernatural theory of diseases. The rational - or scientific - medicine that originated in the 5th century BCE¹⁰ was the prevalent paradigm, however it had to share its space with irrational “medicine”. According to this theory the origin of diseases was to be found in supernatural forces, either the curse of the “Good” - an angry divinity - or of the “Evil” - a vicious spirit, like a demon or the devil itself. This interpretation had a massive influence on Western culture.

The first assumption was based on the assumption that an angry divinity would punish humanity for their sins and disobedience. The most immediate example is to be found in the Christian Bible, that right from the beginning depicts humans as sinners, who angered their God by disobeying him. The first damnation that God perpetrated upon humanity is described in the Book of Genesis, where one of the punishments inflicted upon Adam and Eve was the susceptibility to diseases. Again, in the Book of Exodus, when the Pharaoh refused to free the Israelites God inflicted a series of plagues upon the Egyptians. Modern theories on alleged sins that irated God generated from the “Jerry Falwell Phenomenon”: Falwell (Aug. 1933 - May 2007), an American Southern Baptist, pioneered the idea that HIV/AIDS was the divine punishment for the sin of homosexuality. Not only homosexuals were affected but also the society in its entirety due to its tolerance towards it¹¹.

The second idea that blames the “Evil” for epidemics runs on the same lines of the previous theory, nevertheless sin is not contemplated. As a matter of fact, epidemics would be caused by malignant spirits embodied in evil people, namely witches. According to this theory, epidemics are unpredictable, derived by no logical events but diabolic plots. This theory was led by fear and mass hysteria that gave rise in the 17th century to scapegoating - i.e. “witch hunting” in order to eradicate the malign and

¹⁰ The further paragraphs will provide more information on the matter.

¹¹ <https://www.theguardian.com/media/2007/may/17/broadcasting.guardianobituaries>

punish the guilt, taking to the stake innumerable innocent people who were accused of alleged witchcraft.

According to the supernatural theory of disease, epidemics would be the fair punishment of God for “our” sins - consequently to enjoy health one needs to renounce sins, repent and obey the Bible and those who claim to be the intermediary between God and men, e.g. priests. On the other hand, epidemics would be illogically caused by evil spirits who possessed people and acted through them. In both cases, groups of society would be targeted and scapegoated in an attempt to either appease a divinity’s wrath or get rid of the malign.

1.2.2 Theory of Humor

The second theory is the theory of the four humors. It is fundamental to reiterate that this theory was contemporary to the others and very relevant. In fact, it originated in 5th century BCE in the Hippocratic treatise *The Nature of Man* by Hippocrates’ student and son-in-law Polybus. Hippocrates argues that all diseases have their origin in the environment.

The humoral theory is concisely summarized by the following quote from the Hippocratic treatises:

“The human body contains blood, phlegm, yellow bile, and black bile. These are the things that make up its constitution and cause its pains and health. Health is primarily a state in which these constituent substances are in the correct proportion to each other, both in strength and quantity, and are well mixed.¹²”

A fundamental assumption of humoral medicine is that the macrocosm of the universe and the microcosm of the body would be connected and interact with one another. A disequilibrium in one results in a disequilibrium in the other. Both macrocosm and microcosm are composed by four elements that correspond to one another and share the same nature:

- Earth / black bile: dry and cold, corresponds to autumn;

¹² <https://archive.org/details/hippocraticwriti0000hipp/page/262/mode/2up>

- Water / phlegm: cold and wet, to winter;
- Air / blood: hot and wet, to spring;
- Fire / yellow bile: hot and dry, to summer.

Each element would also correspond to a different human emotion - black bile to melancholic, phlegm to phlegmatic, blood to sanguine, yellow bile to choleric - thus, in order to keep the overall balance of a person's health it was important to perform certain exercises, e.g. sleep, exercise, diet, voice exercises, advice. Fundamentally, the equilibrium ("eucrasia") constituted health. The disequilibrium ("discrasia") - was either the excess or the deficiency of one or more of the humors - causing sickness, corrupting and poisoning the body (Snowden, 2019: 31-43). Diseases were unfixed entities, as no notion of individual illness had been elaborated yet.

Bearing in mind that "doctors were mere inclined to cure rather than to prevent disease" (Cavallo & Storey, 2017: 32), to remain healthy the individual had to keep in balance six elements: the so-called six "non-naturals", concept elaborated by the Greek physician Galen in the 2nd century AD. They included air, motion (exercise), wakefulness (sleep), food and drink, excretion and passions of the soul. The status quo could be restored through the loss or regulation of bile or phlegm, helping the body of the patient to defeat the illness. This was achievable through sweating, purging, vomiting, sneezing, urinating and even through bloodletting/venesection (veins were cut with an instrument, the lancet, to let out excessive blood). The other therapeutic interventions included regulation of diet, prescription of exercise or rest, a change of environment and calm for the emotion¹³, the latter intended for the other persons who surrounded the patient to avoid delivering him/her shocking news. Instead, they were required to be kind and express the ill friend or familiar their love, affection and, broadly speaking, positive emotions (Cavallo & Storey, 2017: 118).¹⁴

¹³ https://www.academia.edu/25169395/THEORIES_OF_DISEASE_A_PAPER_PRESENTED

¹⁴ An interesting tome about the conservation of health was written by Sir Thomas Elyot Knight (1490?-1546), with the title *The castell of health, corrected, and in some places augmented by the first author thereof, Sir Thomas Elyot Knight*. The volume provides an elaborated and detailed list of actions to take and behaviours to hold, together with a list of herbs, roots, spices, bread, flesh, fish, diets and all food-

Theory of humor had its fundamentals in nature and had been relevant for a long time. Hippocrates firmly believed that there was no such thing as “sacred disease” and that everything had causations localisable in the natural world. The reason for illnesses is to be found in nowhere but the body. Finally, as affirmed by Cavallo & Storey (2017: 7) as regards to Italy, health consciousness was not introduced as a sign of piety, but rather an evidence of civility and rationality. By mentioning rationality, it is almost possible to discern what would emerge much later during the Italian Enlightenment age. In fact, it is important to reiterate how the boundaries between each of the disease theories were not clearly defined.

Before moving on to the following theory, a brief final comment on Hippocrates’ principles is essential. As a matter of fact, after discussing his competences on the medical field, it clearly emerges no apparent relation to epidemics. The question one would ask itself is - if Hippocrates believed in the humor theory, how did he justify epidemics?

His *Corpus Hippocraticum* contains seven books, titled “Epidemics”. The meaning of the term has been subjected to nearly 2500 years of evolutions and modifications and depicts the evolution of science and medicine over the time. Semantically, “epidemics” had a different inflexion. According to an online article of US National Library of Medicine - National Institutes of Health (Martin & Martin-Granel, 2006) it is possible to affirm that according to Hippocrates an epidemic indicated a set of syndromes occurring at a given place over a given period. Only several centuries later in the Middle Ages the waves of Black Plague allowed physicians to finally recognize epidemics of the same, well-characterized disease. The affirmation of the meaning of “epidemics” as we know it today occurred thanks to the germ theory.

Therefore, it is possible to affirm with some certainty that Hippocrates would employ the term “epidemics” without meaning what is intended today through the

related matters that would keep the body healthy. For the full text: <https://quod.lib.umich.edu/e/eebo/A21308.0001.001>

same vocable, however close he would be to its current meaning. With this consideration in mind, one shall now proceed to the next theory, which is to be considered the logic thread that connects Hippocrates' considerations, the humor theory and the following two.

1.2.3 Theory of Contagion

The theory of contagion was introduced thanks to Galen (born 129 CE, Pergamum - died c. 216). He was a Greek physician, writer and philosopher whose ideas were close to those of Hippocrates, his source of his medical competences. Galen mentioned hypothetical "seeds of disease", a view that tried to explain the cause of diseases and suggested the possibility that some illnesses could be contagious (Theories of Contagion, 2020). Just like a seed, a disease would implant itself into a host and grow, feeding on the body resources of the individual.

This theory was not developed further, as Galen believed in the cure of the Non-Naturals and the equilibrium of the four humors. Nevertheless, the theory of contagion deserves its room among the theories of diseases, as it can be considered as a mid-way between the humor and the germ theory. The focus of medics and physicians kept being, for a long time, the balance of the four humours - black bile, yellow bile, phlegm and blood - rather than the search of unknown and unplaceable "seeds". As aforementioned Galen himself relied on the theory of the five humors and he asserted that therapy simply consisted of maintaining health. He did not apply or develop a new branch of medicine or a new theory about the seeds of diseases. He contributed to the Hippocratic discipline by cataloguing the six "non-naturals". Among these, air was the linking element with the next theory, the miasma one: air. Air could be corrupted (or, as it will be mentioned in the next paragraph, could be "miasmatic").

1.2.4 Miasma Theory

This fourth theory was a Galenic notion and was elaborated during the 18th century coinciding with the advent of the European Enlightenment. Classic health advice based on the "non-naturals" declined and a medicine connected to the environment emerged. The scholars of the Enlightenment school of thought considered the environment the central element to understand diseases. Accordingly, the reason for which diseases

happened was the environment itself as it produced illnesses, due to its poisoned/spoiled/contaminated or, in fact, *miasmatic* atmosphere which would penetrate through the open pores of the skin (assumption that led to warn against baths, considered dangerous). There were no such things as insects and parasites which acted as vectors for diseases.

Although the Non-Naturals concept was decaying, two of them survived, i.e. air and food, however the difference consisted in that more attention was paid to quality. Thus, on one hand, the impact of air, climate and weather on human bodies; On the other hand both the quality of water and the quality of food, both dependent upon the quality of soil that could be contaminated by waste, either organic or industrial. Physicians now moved their focus from how to *cure* a disease to how to *protect* the population from them. Around this period the emphasis shifted from the individual to the population, leading to the first measures of public health¹⁵. The Enlightenment school of thought was in fact concerned with the overall health of all the population, not of the single individual. (Cavallo & Storey, 2017: 159 et seq).

Miasma theory was interpreted differently according to the place considered, as the environment and the variables differ according to the area. Focusing the attention on Italy, in its territory abund two natural phenomena: Earthquakes and volcanic eruptions (Naples and its nearby cities). Some airs were considered beneficial, e.g. eruptions emit exhalations - sulphur and bitumen - which in normal conditions preserve bodies from epidemics by balancing the hot and dry. However, one can also discern how the air was linked to natural phenomena and affected the bodies of the entire collectivity. Nevertheless, volcano eruptions would also strike fear. Common people would attribute their eruptions to demonic forces - a link to the supernatural theory of diseases - in opposition to the idea of physicians, including Francesco Spinola (1535-1639), that sulphur would be able to protect the body from putrefaction and plague. However, Spinola also added that diseases would nonetheless be caused by inundations following the eruptions, as it may generate stagnating water (Cavallo & Storey, 2017:

¹⁵ Public health measures will be analyzed in chapter 2.

136-147). In this statement it is possible to infer a connexion to the germ theory that would be developed later in the mid-19th century.

In opposition to the assumption about good exhalations, on the other hand fumes produced by the fermentation of underground minerals would release noxious gases. According to the Italian physician Leonardo Di Capua (1617-1695) fermentation coming from the underground would reach the atmosphere and cause diseases, earthquakes and volcano eruptions, becoming an all-encompassing explanation for all natural events including ailments. This theory was also connected to the “old” idea of humors: body fluids would fermentate and cause sickness (usually fevers).

In this period of time “chymistry” emerged as a discipline of study in the field of miasmatic theory as the elements - earth, waters, air, fire, hot, cold - had their own body¹⁶ and could influence terrestrial phenomena as much as terrestrial phenomena influenced them. Chemical preparations became common in the late 16th century among the Italian *speziali*, the forebears of today’s *farmacisti* (eng.: pharmacists, apothecaries). This ancient apothecary would prepare medicines thanks to his knowledge of minerals, vegetables and even animals. He knew the organoleptic characteristics of simple medications therefore he could pick the best therapeutic properties. Finally, he would collect and preserve them and administer the right dose¹⁷. Chemistry gave rise to a “close relative” of miasma theory, the so-called zymotic theory of disease, that held that epidemics were triggered by chemical processes. Fermentation of organic materials would emit miasmatic fumes, released in the air providing that soil, temperature and humidity conditions were favourable (Snowden, 2019: 246).

Miasma theory, contrary to the previous ones, is not a linear doctrine. Although its base was grounded on polluted atmosphere, there were several variations according to the country considered and its intellectuals. This was caused by the diversification of environment and climate as we could observe in the example of Italy. Namely, Italy is a territory largely affected by natural phenomena and characterized by volcanoes in the

¹⁶ According to Telesio and in opposition to Aristotle's theories.

¹⁷ <http://www.ordinefarmacistisiena.it/storia/speziale.html>

south, while another country who could be relatively close - such as the United Kingdom - might be dominated by a different climate and phenomena. Finally, it is important to the progress of medicine thanks to the emergence of new medical figures, for example the *speziali* in Italy, who could complement the work of physicians and surgeons.

1.2.5 Germ theory

The germ theory of diseases was elaborated during the 20th century thanks to important scientific findings and technological inventions, among which the microscope, the inoculation and vaccine. This chapter is going to give a brief insight of the scientific discoveries and scientists that led to the current theory of germs. An important role was played by Antoni van Leeuwenhoek, the English Edward Jenner and three scientists: the French Louis Pasteur, the German Robert Koch and the English Joseph Lister. The role of medicine professionals was better defined, new medical disciplines emerged¹⁸. This is the theory that still applies to this day.

The germ theory of diseases states that illnesses are caused by microscopic beings called germs. The Dutch Antoni van Leeuwenhoek (1632-1723) who was not a university-trained intellectual but a simple draper, was the first one who was able to observe them. He discovered the magnification (275x) with a single-lens microscope as he was intent to examine the quality of the threads in the cloth he was working on. His interest went beyond fabric and he became a self-taught man of science. He observed the first germs, which he called “animalcules” - from the Latin “*animalculum* = tiny animal¹⁹.

Italian contributors to the germ theory include Agostino Bassi (1773-1856) and Giovanni Battista Grassi (1854-1925). Bassi can be considered the precursor of Pasteur, Kock and Lister. He had a law degree but an eye disease led him to dedicate his life to agriculture and to research in this field. His contribution derives from his studies on a

¹⁸ To stay on topic, many concepts will be skipped but resumed in chapter 2.

¹⁹ At first, before the invention of the achromatic lenses that corrected the visual distortion, van Leeuwenhoek's first images through the microscope were more blurred. This is, allegedly, how he saw “animalcules”: <https://www.newscientist.com/article/dn27563-leeuwenhoeks-animalcules-just-as-he-saw-them-340-years-ago/>

disease that struck silkworms, which at that time was causing massive economic damages in Italy and France. The general assumption regarding the silkworm illness - *mal del calcino* - was that it was caused by the atmosphere, while Bassi found out that the real reason was a “living being”, namely a parasite that would affect the silkworm and that was contagious. His interest included also the research of methods to eliminate the microorganisms by means of experiments. Thereby he laid the foundations of the modern concept of disinfection and contagion prevention.²⁰

Giovanni Battista Grassi was part of a research group that aimed at the identification of the malaria vector. Malaria killed a massive number of people every year. Grassi studied the illness first in the birds and next in human beings and came to the conclusion that it was caused by an external factor, possibly insects. He interviewed farm workers, who reported that they were bothered by a particular mosquito, thus Grassi started experimenting with the insects that farmers described him and he finally identified the malaria vector. He worked on this disease all his life, and thanks to his discovery in all Italy wetlands were reclaimed and a campaign of malaria mosquitoes extermination was put in place.²¹

Before talking about Pasteur and his contribution to the elaboration of the germ theory, it is necessary to introduce a predecessor, who in the former century laid the foundation for the elaboration of vaccination, namely the English physician and scientist Edward Jenner (1749-1823). Jenner accomplished the first important finding for the germ theory as he discovered the first method to prevent epidemics, i.e. inoculation. Inoculation²² is a technique to induce immunity by the introduction of the pathogen into the person’s body, a method that was applied to prevent smallpox (Manela, 2015: 259).

First of all, Louis Pasteur (1822-1895) discovered that fermentation was not a chemical process, rather a bacteriological process, in which bacteria could be destroyed through “pasteurization” (application of heat). Thanks to his experiments he was able

²⁰ https://www.treccani.it/enciclopedia/agostino-bassi_%28Dizionario-Biografico%29/

²¹ https://www.treccani.it/enciclopedia/giovanni-battista-grassi_%28Dizionario-Biografico%29/

²² from the Latin *inoculationem* - *inoculatus* = *in* (in) + *oculus* (eye): an “engrafting, budding” (from: <https://www.etymonline.com/word/inoculation>).

to prove that some diseases, for instance cholera, were not generated by a specific climate but instead by the importation of a specific bacterium (in the case of cholera, a *bacillus*) that causes the outbreak. Moreover, Pasteur was able to apply the pasteurization process to the struggle against diseases. Thanks to him, public health practice of vaccination was developed.

Secondly, Robert Koch (1843-1919) contributed to the germ theory thanks to his studies on anthrax and the bacteria that caused it. He provided solid evidence to the germ theory as he, in addition, investigated the aetiology of said diseases revealing the spores that remained in the fields and infected animals that would roam. He was the first scientist who published photographs of bacteria²³, namely the anthrax *bacillus*.

Finally, Joseph Lister (1827-1912) contributed to the surgical field as he proved that infection in fact did not arise spontaneously from alleged toxins release of dying tissues. Instead, infection would occur through contamination brought about by airborne microorganisms carried by dust. In his work *On the Antiseptic Principle in the Practice of Surgery* (1867) he listed several solutions in order to prevent infections in surgical patients (Snowden, 2019: 246 et seq).

The germ theory of diseases was established thanks to the scientific revolution of the 18th-19th century. This is the most recent theory and, indeed, the first that relies on empirical science. For this reason, it is the theory that is still applied nowadays to medicine practices, either preventions, cures or surgical operations.

1.3 Demography, Population, Epidemics

Demography is “the study of changes in the number of births, marriages, deaths, etc. in a particular area during a period of time²⁴”. The timeframes analyzed are relatively short as the equilibrium between population and sources is usually interrupted by catastrophic events (e.g. epidemics). This section will deal with the changes linked to

²³ See more at: <https://edoc.rki.de/handle/176904/5140> , pp. 25-26

²⁴ <https://dictionary.cambridge.org/dictionary/english/demography>

epidemics, to provide background information and better understand the further chapters. Moreover, it will be analyzed the impact of epidemics on demography science - therefore on population. This chapter aims at the recognition and classification of elements and forces that make this relationship so close, affecting humanity in relevant ways. In some cases, the action of these factors was so strong that entire populations were either exterminated or reduced by a great portion. The main protagonists of epidemics are people, which is the motivation why before discussing the way the population and the government used to and still deals with epidemics, it is necessary to consider it regarding the science of demography and the way it interacts with the population.

1.3.2 The vital strategies

Quoting Livi Bacci (2002: 9), population can be considered a “rough sign of well-being”: a high density of population talks of social stability and positive relationships between individuals and among people and resources. Two hyperbolic examples are cities versus the desert. It is evident that the desert, being mostly inhabited, entails the impossibility of interactions with resources and of creation of any kind of relationship.²⁵

Firstly, the starting point of the analysis in this chapter begins by considering the relationship between territory and population. Biology and environment are connected to the point that every species in the world ensures its succession by adopting tactics, called “vital strategies”. According to the species, the reproduction moves along one of two “vital strategies” (Livi Bacci, 2002: 19). These are identified in type “r” and type “K”. The first kind, the “r”, colonizes unstable environments and is characterized by fast reproduction in large numbers contrasted by a low survival rate. Fish, birds, insects and some small mammals fall in this category. The second type, the “K” strategy, includes medium and large-size mammals - species that withstand hard environmental

²⁵ The conception of population as a positive resource and a symbol of power is grounded on mercantilism theory (16th-18th century) and cameralism (18th-early 19th century), opposed to absolutism. According to it, a large population provides labour supply and a market and the state power could be strengthened thanks to the increase in its export (from: <https://www.britannica.com/topic/mercantilism>). Cameralism aimed at strengthening the power of the state administration and substitute the entirety of the production process - thus not relying on materials imported from the colonies anymore (from: https://www.treccani.it/enciclopedia/cameralismo_%28Enciclopedia-delle-scienze-sociali%29/).

conditions. Just like the previously described kind, they live in a competitive environment, however the rule of “large number” does not persist. In fact, parents invest resources, time and energy per every single descendent.

The vital strategy of human beings is the type “K”. Despite the clear division according to the characteristics of the living beings, in some phases of its history the vital strategy of humans was less accentuated compared to the future. In essence, it is safe to affirm that the choice of vital strategy begins on a common path: the chance of surviving. Up until the first scientific discoveries in the medical fields (i.e. inoculation and, later, vaccines) the survival rate was generally low. During the 18th century the possibility for a mother to outlive her pre-adolescent kid was still 1 out of 4 (Livi Bacci, 2002: 146). This is one of the reasons why the families were so numerous: kids were considered a social security, even though the downside was a higher competition for resources. On the other hand, when the chance to survive improved, a large number of births would be counterproductive as it would lead again to competition for resources. In the last century the vital strategy “K” has definitively established itself as the dominant human beings’ strategy. In addition to a strong resilience, humanity has an “extra gear” compared to the other species: it has transformed its resilience into the ability to fight some of the most difficult environmental conditions through scientific inventions and discoveries that limited and/or ended epidemics.

1.3.3 A constraint force: diseases in the Old World and in the New World

Between the 0 AD and the 18th century and roughly the first decades of Industrial Revolution, Europe had mainly three waves of expansion and crisis:

1. Crisis: barbaric invasions and plague (ca. 500 AD) - expansion: 1200-1300
2. Crisis: plague (1300) - expansion: 1400-1500
3. Crisis/stagnation: right before the expansion (1700)

These waves were determined by two forces: choice and constraint. Choice consist in marriage, birth control and migrations. Concerning constraint forces, there are two types:

- Unmodifiable: climate, space;
- Modifiable: disease, land, energy, food, settlements.²⁶

The effective number of persons is determined by external factors, that is those elements that perform from the outside and are uncontrollable. Disease is a modifiable constraint force; however modification happens slowly. The elaboration of new medicines and technologies requires a period of time that forces the population and human body to adapt and be flexible in the meantime. Adaptation is for some illnesses translated in immunity.

1.3.4 Sedentarity: a starting point

We will now explore in which ways the constraint force of disease is able to deeply affect the survival rate of human beings by considering the theory according to which sedentarity is connected to outbreaks of diseases. Human evolution thanks to the *homo sapiens* phase led the population to be more concerned with agriculture and thus mostly sedentary. It consisted of a gradual transition from hunting to agriculture. Sedentarity is a feature that made human race more exposed to epidemics for a series of reasons:

- High density of population;
- It creates a favourable environment for parasites;
- Water storing;
- Animal breeding.

It is during the first decades of the first millennium that indeed population density increased hand in hand with agriculture, creating the conditions for epidemics. Webb (2015: 54) points out that human beings never lived free from disease, which always inflicted severe suffering and/or death. However, they were episodic and transitory as human groupings were “too small to circulate the infection on an ongoing basis[...]”.

²⁶ See more at Livi Bacci, 2002: 48 et seq. For reasons related to space and to stay on topic, it will be only considered the constraint force of ailments.

Sedentarity created a favourable environment for certain parasites, such as fleas, that could prosper and multiplied more rapidly. In a similar manner, water-borne diseases - like cholera - started affecting people and specific insects that transmit germs prospered. Additionally, animal breeding led to diffusion of zoonoses (disease or infection that is naturally transmissible from vertebrate animals to humans²⁷). Some zoonotic diseases are measles, mumps and chickenpox which, according to Webb, made the Old World disease environment more deadly than those in the New World (Webb, 2015: 57).

The first catastrophic event that afflicted Europe was the plague, that allegedly reduced the population of $\frac{1}{3}$ between 1340 and 1400²⁸. High density of population, combined with mobility, were the main factors of transmission of the infection. Defence mechanisms activated by the government, such as quarantine and isolation of infected people did not work, therefore some adaptation mechanisms were activated: a general reduced birth rate, either by choice or by constraint.

Constraint force also applies to the case of indigenous people of America after the arrival of the Europeans. Although in this occasion adaptation mechanisms were activated, birth rate never boosted again. To this day it is quite challenging to make a precise estimate of the total population and of the total or approximate number of deaths of native Americans, as scholars were not able to obtain reliable or complete data. What one knows is that the intrusion of Europeans led to a massacre of the natives: the principal illnesses brought in were syphilis, smallpox, measles and typhus (Cook, 2015: 110). These illnesses were in general very violent but their destructive force was especially intense among native Americans. The reason provided by history professor A. Crosby (1976: 289) is the “virgin soil epidemics”. In his words:

“Virgin soil epidemics are those in which the populations at risk have had no previous contact with the diseases that strike them and are therefore immunologically almost defenseless”.

²⁷ <https://www.who.int/topics/zoonoses/en/>

²⁸ Livi Bacci, *Storia minima della popolazione del mondo*, p. 19, table 1.3

Webb (2015: 56) simply defines this category of individuals “immunologically-naïve populations”. They are particularly exposed to epidemics for three reasons:

1. There is no advance guard as no one has developed an immunity or antibodies to the virus and mothers pass the sickness to their newborns. Its impact on the society is that - simply put - no one can help anyone.
2. Stronger individuals, those who developed a stronger immune system to the disease, had not been biologically “selected” yet over the course of generations. Virgin soil epidemics target a territory where no individual is less prone to sickness compared to another individual.
3. American Aborigines confided in their customs, religion and medical traditions (e.g. the rapid relocation of the patient from scorching heat to freezing water). They did not take the measures that were adopted in Europe²⁹ and had no conception of disease transmission.

Naturally other causes contributed to the decline, especially physical violence by pioneers and forced labour as well as different social and technological organizations. Nonetheless a great role was covered by the “virgin soil epidemics”, that combined with poor or even counterproductive action to face the illnesses led Native American population to a catastrophic downfall.

1.4 Malthusian model

It is worth mentioning the Malthusian model, elaborated by Thomas R. Malthus (1766-1843), English economist and demographer, although I am not going to devote much space to this theory. It is remarkable to briefly discuss it, as to this day it raises both consensus and dissensus. Elaborated in 1798 the Malthusian growth model describes the action of the constraint forces in the two demographic phases, namely expansion and recession. Malthus’ model aims at the illustration of the irreconcilability of

²⁹ See chapter 2.

population growth and resources that are necessary for survival. According to this theoretical model, population increases in a geometric ratio (e.g. 2, 4, 8, 16). On the other hand, supplies of food rise slower - in an arithmetic ratio (e.g. 2, 4, 6, 8). Population grows in number until "repressive breaks" intervene, reducing the number of people. These repressive breaks are hunger, wars, epidemics.

According to the model, people can sustain themselves up to a specific limit. Above this boundary one or more of the repressive breaks will inevitably come into play - into specific diseases are triggered by an excessive density of population. In fact, as previously mentioned, human evolution of the past century led to sedentarity, which in turn brought about high density. Lastly, density facilitated the outbreak of epidemics.

It can be inferred that although the Malthusian model represents a valid theory, Malthus had a pessimistic view. He in fact assumed that agriculture and the food supply sector in general could only provide so much, and did not have the capacity to grow over a certain limit. However, industrial and agricultural revolution could be sufficient to prove this theory wrong. Furthermore, Livi Bacci points out that Malthus did not forecast a modern modification to his own model. Population growth stalls its growth by lessening childbirth, so that population number and resources reach an equilibrium. This happens because human beings started voluntarily reducing births, as their need to reproduce is not strictly biological anymore. An additional reason that explains the instability of the Malthusian model are the new progresses in medicine of the last centuries that decelerated and delayed the spread of infectious diseases. The latter was able to at least reduce epidemics to small outbreaks. In the next chapter, it will be analyzed what concurred to the decline in mortality in the last centuries.

CHAPTER 2

EPIDEMICS IN THE PAST:

SMALLPOX, CHOLERA, SYPHILIS

This second chapter aims at enlarging the focus and exploring a broad historical framework within the context of epidemics. We will move the focus from the analysis of the concept of epidemics *per se* to the more ample term “pandemics”.

The first step will be the explanation of how epidemics developed into pandemics, thus which were the factors and the underlying causes that led the spread of a single ailment to other continents. This will be explored especially in chapter 2.1, that will describe the concept of transmission of diseases within the Columbian Exchange. The spread of diseases to a much larger scale was triggered by two phenomena. Firstly, agricultural revolutions, connected to biological consequences, and industrial revolutions, that increased the population density thus the exchange of diseases. Secondly, the great explorations, whose initial aim was the search of new trade routes, definitively created and established permanent bridges for the exchange of diseases. This part will be complemented by a brief insight to the alleged influence of genetics on the survival rate of natives.

Next, in chapter 2.2 the focus will move to a smaller area, i.e. Europe. We will firstly analyze the health measures employed in Europe before the advent of the germ theory. In 2.1.1 we will talk about the new health authorities created to cope with plague - guilds, guided by physicians, and health boards, composed by men who were not involved in science. Secondly, chapters 2.2.2, 2.2.3 and 2.2.4 will explore the first health measures adopted in Europe (maritime and land-based quarantine, measures within the outbursts) and in what consisted and how the authorities were involved. The role of the state begins to emerge thanks to law enforcement methods. Although the case studies contemplated in chapter 2.3 are smallpox, cholera and syphilis, in this part it is necessary to mention plague due to its role played in the creation of the first measures of prevention and containment of epidemics. In this regard, we will see how and why

Venice serves as an important example in the creation of health measures such as the quarantine.

Afterwards, part 2.3 will be engaged with the explanation of the scientific revolution that allowed the germ theory to emerge, leading to a demographic change (in the Malthusian model) and great steps forward in the field of illnesses and medicine. This introduction will be followed by the development of three case studies: smallpox and inoculation, cholera and water infrastructure, syphilis and its interference in the story of a country (Great Britain) and, possibly, of Europe itself. Each case will thus be explored with reference to a particular contribution that it had during the past centuries to the role and the problem it still represents to our contemporary society. The case-study of syphilis will be however discussed from a different point of view. The aim is to provide an observation about diseases as a dangerous element that infects every field of both the individual and collective life. Therefore, the goal is to stimulate a reflection about how the illness' symptoms of an individual can undermine the entire community.

The last part, namely chapter 2.4, will be fully dedicated to the reaction of people to epidemics. In 2.4.1 we will see people's reactions to epidemics themselves before the advent of the germ theory. Reasonably, the historical period that will be covered in this chapter is going to be from XV to XIX century and it will be necessary to once again mention the Black Plague. Before the germ theory, the reasons for the epidemics were searched among people themselves, in an attempt to find and punish sinners who presumably brought about the epidemics. Explanations were also searched among supernatural phenomena and folklore. Scapegoating and a need of constant reassurance transpire from the reactions that emerge from this period of time. After the germ theory, some allegations were abandoned, whereas others evolved. We will link 2.4.2 to the case-studies of 2.3, in order to see how the measures implemented after and during the germ theory influenced the reactions of people. What we will see is the emergence of the first no-vax movements (with smallpox), the reaffirmation of scapegoating (with cholera) and the rise of racial-led assumptions.

2.1 From Epidemics to Pandemics

This chapter aims at describing the Columbian Exchange of diseases, to demonstrate when, how and why epidemics became pandemics. The exchange of diseases involved Europe, America and Africa, due to the slave trade. Europe's large number of pathogens, that turned out to be particularly fatal for Native Americans, had their origin not only in Europe but also in the contacts that Europeans had with the Asiatic continent. An example could be cholera, which has its origin in India, was later spread to Europe and consequently to America due to the Columbian Exchange. Because of the nature of the chapter, we will take Europe and America as starting points.

To be able to discuss the shift from epidemics to pandemics, it is necessary to enlarge the focus from the European area to the interactions between the continents, in particular Europe-America. It is essential as pandemics is a concept that widens the range to all the planet, contrary to epidemics that can be referred to a smaller area. The shift's origin is rooted in the first exchanges between the New World and the Old World. This particular phenomenon was called "The Columbian Exchange", named after Christopher Columbus. The term was coined by Alfred Crosby (1931-2018), who mentioned this expression for the first time in his seminal book *The Columbian Exchange: Biological and Cultural Consequences of 1492* of 1972. It indicates the global exchange of human populations, culture, plants, animals, technologies, diseases and ideas between North and South America and Europe, Asia, and Africa. The world started shrinking in terms of distance, as "the oceans became bridges rather than barriers to continents (Parker, 2010: 86)". Across this bridge would however be involuntarily carried also a number of diseases from one continent to the other. From the Americas to Europe would be carried mainly syphilis, while Europeans transferred a much larger number of diseases to the Americas, among which stand out smallpox (to which the natives were particularly susceptible), chickenpox, scarlet fever, measles, malaria, typhus and tuberculosis.

As explained in chapter 1, the illnesses that Europeans spread in the New World had a devastating effect on the native Americans because of their lack of immunity to them. Europeans had been coexisting with such crushing ailments for centuries,

therefore these diseases were endemic to the Old World's population. Before the Columbian Exchange, infections and epidemics would decimate our ancestors though the contagions were mostly localized. From the perspective of epidemiology, they were localized, episodic and transient, as, even though the factor of sedentarity had already been established, human groups were still too small to allow a broad circulation of an illness. Contacts between the groups were rare. The contacts expanded and eventually led to pandemics after two historical events: agricultural revolution combined with industrial revolution, and the Columbian Exchange.

Step 1: Agricultural and Industrial Revolutions

First of all, the first step was triggered by human beings themselves, who became sedentary and thanks to agricultural revolutions and, later, industrial revolutions, density increased. The augmentation in population density brought about several changes, including ecological transformations and vulnerability to diseases.

Risks to health blossomed first of all from domestication of animals that allowed the passing of zoonoses³⁰ from animals to humans, settling in core areas of sedentary communities. In addition, humid habitats and areas for agriculture opened up uncontrollable reproduction of certain insects that carried diseases, e.g. mosquitoes which carried malaria. Another risk to health stems from wind-blown fungal blights which could reproduce themselves with ease. Industrial revolutions, on the other hand, brought about the movement of sizable groups of individuals from the countryside to the city, making some diseases endemic to the Old World. Emigrating persons carried diseases with them to which they, sometimes, already developed partial or full immunity. Therefore it is safe to say that through agricultural revolutions diseases travelled from a village to another, usually a closer one, whereas industrial revolutions caused illnesses to be displaced in bigger and more high-density populated cities, where perhaps certain illnesses previously did not even exist - or barely (Webb, 2015).

³⁰ Zoonosis: “[...]infectious disease that has jumped from a non-human animal to humans. Zoonotic pathogens may be bacterial, viral or parasitic, or may involve unconventional agents and can spread to humans through direct contact or through food, water or the environment.” (Def. from WHO at <https://www.who.int/news-room/fact-sheets/detail/zoonoses>)

Step 2: The great explorations

Epidemics definitively turned to pandemics due to the Columbian Exchange. Webb (2015) argues that epidemics of the 12th-13th centuries in Europe stimulated a process of internal transformation, as political power³¹ and economic competition expanded parallelly. Political power, which depended at the time on alliances with traders, pushed for the expansion toward maritime trade. When the first ships left European ports to explore the Atlantic Coast of Africa, they were looking for new passages to the East to replace the traditional Silk Road and those routes that crossed dangerous areas, that contributed to the loss of a great part of merchants' loads to brigands and weather conditions. Aiming to reach the Indies across the ocean, the Italian explorer Christopher Columbus departed from the port of Palos on August 3rd, 1492. Instead of the Indies he arrived on October 12th at the Isle of San Salvador, and then Cuba and Haiti in the Americas. This event marked the beginning of the Columbian Exchange, that involved a transnational exchange of human populations, culture, plants, animals, technologies, ideas and, particularly, diseases. A brief insight will be dedicated to the way natural selection affected genes and mortality among native Americans.

Webb (2015) states that, in spite of the lack of large working animals amenable to domestication across the two Americas, the territory was not disease-free. The difference laid in the fatality of the illnesses, as the New World's ailments were less deadly than the Old World's. Notably deadly was smallpox, to such an extent that it can be regarded as a main element that symbolizes the shift from localized epidemics to pandemics. With a fatality rate of 30%³², smallpox represents the very first great example of an illness that became pandemic and threatened populations across continents. It is interesting to dedicate a brief insight about biological reasons that led natives to such a huge annihilation, thanks to the assessments of Cavalli-Sforza (2001). The author's argumentation is that certain "less-adapted" genes may have contributed to the high fatality incidence among natives. Native American's incidence of O blood type is nearly 100%, however pre-Columbian mummies dissections found evidence that A

³¹ The increase of state power during the plague years will be discussed in chapter 2.2.

³² <https://www.who.int/biologicals/vaccines/smallpox/en/>

and B blood type did exist, at least before the arrival of the Europeans. If this supposition is valid, one could assess that the - let's call it - natural selection occurred during the Columbian Exchange had led to the disappearance of A and B blood types from the native Americans, suggesting that those genes succumbed to the natural selection, whilst O blood group was resistant to syphilis. The way natural selection works leads certain populations to have greater or smaller probabilities to survive and resist certain adverse conditions, e.g. diseases³³. It can therefore be advanced the hypothesis that a factor that impacted on the extinction of indigenous populations might be "less suitable genes" combined with the "virgin-soil epidemics³⁴" and a dose of luck (according to the Japanese population geneticist Motoo Kimura³⁵). Cavalli-Sforza concludes stating that, although they make individuals more susceptible to other infections, ABO alleles confer resistance to certain infections, including, as a matter of fact, smallpox (Cavalli-Sforza, 2001: 42 et seq).

A series of factors and events demonstrates how epidemics, that until the 15th century were relatively localized, turned into pandemics, affecting the population worldwide. Large areas had already suffered large epidemics (such as plague in Europe). The expansion of epidemics is directly proportional to the size of human beings' groups. This is the motivation why sedentarity, combined with agricultural and industrial revolutions, caused the spread of illnesses in larger areas. On the other hand, America's discovery is the moment in which the world started metaphorically shrinking, shedding a different light on distances and barriers. As a matter of fact, oceans would now be bridges to new territories, that apart from new innovations, allowed the transfer of diseases from a continent to the others. The case of smallpox sums up the passage from epidemics to pandemics.

³³ Adverse conditions in the context of natural selection shall not be confused with constraint forces (see chapter 1.3.3).

³⁴ See chapter 1.3.4.

³⁵ See Cavalli-Sforza (2001), pag. 43

2.2 Before the Germ Theory: Health measures in Europe

In the past, in Europe, there was no such thing as a coherent public health policy until the Renaissance. The role of the state would start to affirm itself during the plague epidemics, becoming effective during the 17th and 18th centuries with the emergence of the modern state. Albeit it was still influenced by the limited knowledge and skills in the medical field. Venice, as we will see, played a major role in the establishment of measures against epidemics. We begin this topic with the clear assumption that, as we have seen in chapter 1, before germ theory what predominated was miasma and humor theory, while physicians applied the knowledge issued by Hippocrates' treaties. Science did not possess the advanced instruments and the competences that would have emerged at the end of the 19th century.

During the Middle Ages the first steps toward the creation of a pseudo-efficient public health system were made. During the 15th century the plague epidemic struck Europe creating so great an emergency that European states expanded their power putting into action the first rudimental anti-epidemic measures in order to limit the movement of people and promote isolation. The governments dealt with the unsanitary conditions of the cities and quarantined ships in an attempt to limit the spread of disease. Furthermore, the first hospitals dedicated to the emergency were established, meanwhile medical care and social assistance was provided. The first cities to adopt measures were the Italian port cities of Venice, Florence, Genoa and Naples, whose strategic positions made them a crossroad of travellers and imported goods from the Middle East and North Africa. State power relied on the military to implement and enforce them, representing a point in history where the role of the modern state, at least in the western countries, started to affirm itself by imposing decisions on the population and implementing them by means of force and constraint.

2.2.1 Health authorities

During the Middle Ages, three authorities emerged: Guilds and Health Magistrates (also called plague commissioners or boards of health). They represent the first rudimental authorities who were able to impose their decisions on the area of healthcare of the

countries' population. They were both feared and hated, and in some cases, they were also able to engage groups of citizens in order to collaborate with them.

a) Guilds

The first important authority that emerged in the Middle Ages are guilds. These groups can be defined as an organization of persons with the same job or interests. Among them, we can distinguish the medical-related ones of physicians and surgeons. Though very diversified according to the country, the guilds belonging to medical areas constituted a local governing body, in an attempt to create a hierarchy of legitimate practice grounded on determinate levels of knowledge and the individual's skills. They constituted one of three important health authorities figures as in some cases they would be involved into the commercial and social governance of the city. For instance, in the United Kingdom Henry VIII - who approved in 1540 the constitution of the Company of Barbers and the Guild of Surgeons - legally allowed physicians to conduct inspections at apothecary shops to assess the quality of their medicines, and, when/if necessary, prosecute those who practiced physic and therefore interfered with their monopoly. The guilds of surgeons and physicians began, in the later medieval period, to feel threatened by apothecaries, figures that did not have a specific instruction or skills: they were specialist retailers who practiced medicine as a second job (Booth 2018).

b) Health Magistrates/plague commissioners/boards of health

Secondly, an important role was covered by Health Magistrates. They were an authority, created under the specially drafted institutional framework of "plague regulations". The first ones to experiment them were the self-governing Italian city-states of Venice, Milan and Florence, as they established special emergency boards consisting of a limited number of important male individuals - not physicians. They created special rules in order to cope with the epidemic or the aftermath. The first permanent health magistracy was established in Venice in 1485, followed by Milan and Florence. With the decree that established it in Venice, three noblemen were given the task of Health Supervisor/Magistrate (*Provveditori alla Sanità*) that they could not refuse. Each

*sestiere*³⁶ had its own President, who had to report cases of illnesses, and three authorities (*Soprastanti*) in charge of the quality of food. In the other cities of the Republic of Venice there were other health offices connected to the main one in Venice (Cipolla, 1989).

Snowden (2019: 93) and Byrne (2013: 208) maintain two different claims. The first argues that, originally, health magistrates were created with the intention of being temporary, though by the end of the 16th century they became permanent agencies called plague commissioners, or boards of health. The second scholar claims that they enjoyed a permanent status. Although this step is not completely clear, it is safe to affirm that these boards/commissioners/magistrates were assigned a large authority on the control and supervision of population not only relatively to plague issues, but to ensure that the individuals of the community did not constitute a danger to governance. In fact, their already broad powers would become expansive during plague times, as they spread their monitoring and legislative authority to other issues i.e. sanitation, medical care, trade management (during epidemics), prostitution and control of the poor and itinerant tramps. During the periods of plague outbreaks, they had the power to collect plague victims who would not be taken care of at their home. Moreover, they could decide for the restriction of the movements of anyone suspected of being infected and even barge into the homes of victims and destroy all of their possessions to safeguard public safety (Byrne, 2013: 207 et seq).

In certain cases, these boards would act in order to keep potentially infected people inside the plague region. What has been discussed so far might lead to an erroneous assumption about the interpretation of diseases at the times of plague. In fact, although it is evident that the authorities aimed at separating the infected from the health individuals, one shall remark that this did not happen due to the advent of germ theory. At the time people still believed in the miasma theory and balance of the six “non-naturals”. This was the motivation behind the isolation of infected areas or country and the destruction of belongings. According to the opinion of the time, “plague

³⁶ Venice was divided in six parts, called “sestieri”: Cannaregio, Castello, Dorsoduro, Giudecca, Santa Croce, San Marco, San Polo. A translation of the word “sestiere” can be “district” (from: <https://evenice.it/venezia/storie-tradizioni/venezia-i-suoi-sestieri>).

particles” would stick to clothes unless they were made of determinate materials³⁷ and a certain miasmatic atmosphere of infected areas was the reason for the rise of plague. At times, the hypothesis of contagion was mentioned. Nonetheless, as argued by Cipolla (1986: 75) the idea of contagion was considered so utterly terrifying that the same term would be simply used as a synonym of “plague”. The reluctance was fully conditioned by the theoretical approaches by Galen and gave expression to this blend of truth and falsehood. Health magistrates applied Galen’s concepts and acted accordingly.

2.2.2 Maritime quarantine

Maritime quarantine introduced the quarantine and social isolation of infected people. To compel with it lazarettos/pest houses were instituted. To enforce these measures an effective and efficient state power was needed. In this section the attention will be focused in particular on Venice, birthplace of lazarettos and quarantine.

The concept of maritime quarantine consisted in a period of confinement of forty days on which the public health strategy was based. The reason for its length was not linked to medical motivations, rather to a biblical concept. Quarantine derives from the Italian term *quaranta* (forty), due to the numerous references to this number in the context of purification - e.g. the forty years of the Israelitis’ wandering in the desert, the forty days and forty nights of flooding in the Genesis, the forty days spent by Moses on Mount Sinai. It is in fact worth recalling the supernatural theory of diseases, which was very prevalent during the centuries before the European Enlightenment. In Venice maritime quarantine was instituted to insulate the Republic from the plague invasion by sea. The ships arriving from the Mediterranean Sea were redirected to the *Lazzaretto Vecchio* and *Lazzaretto Nuovo*, built by boards of health in 1423 and 1468.³⁸ According to Vanzan-Marchini (2004: 19), the Italian term *lazzaretto* stems from the vulgarization of the term Nazareth to *Nazaretum*, and then *lazzaretto*. In 1423, due to the regular plague epidemics in the city of Venice, the island of *Santa Maria di Nazareth*, located

³⁷ See chapter 2.5.1, letter b).

³⁸ Before their institution, the closest sanitary structure to lazarettos were the leprosaria. However, they cannot be considered into this analysis, as they were “[...]noncurative institutions and did not contribute to the development of public health strategies (Snowden, 2017: 49)”.

nearby the *Lido*, was chosen as the location of the first permanent hospital managed at state level: *Lazzaretto Vecchio*. It was an unusual choice, as until that moment the hospitals were founded by either monastic orders or benefactors, and were managed by volunteers.

The vessels from the Mediterranean, sighted by the lookouts (*novellisti*) from Saint Markus' tower bell, announced the arrival of the ship to the authorities. A guard took care of the ship and kept it docked. Another guard escorted the captain in front of the health office, where a scribe would take note of the quantity and quality of the ship's wares, their origin and whether they had already been sanitized in another place. Moreover, the level of security of the ship had to be established by declaring eventual deaths, illnesses and encounters - accidental or not - with other vessels. At the same time, the guard that was taking care of the ship itself wrote down the name of all the passengers, inventoried the goods and personal belongings. Everything was then forwarded to the Health Magistrate who verified the authenticity of the captain's declarations. Lastly, passengers and the ship's goods were brought to the *Lazzaretto Nuovo*. There, the items and goods were sanitized by scrubbing and fumigating them with substances of balsamic nature, together with the passengers' belongings. These would be let out in the sun, aired and fumigated. At the end of the forty days the ship and its passengers were allowed to enter the city (Vanzan-Marchini, 2004: 208-209).

The Republic of Venice had specific standards to control the movement of traded goods and to avoid the infiltration of epidemics in its territory. The health policies were formulated on the basis of mercantile logic, avoiding the eventual damage of its power and competitive power among the other ports. Lazarettos, quarantines, and the procedures of goods ventilation were shaped hand in hand with Venice's economic and political interests. Plague did not lead commerce to a deadend. The Republic boasted a great ability to defend not only itself but the continent from the epidemics that arrived by sea and by land, in a never-ending confrontation with the Ottoman authorities that refused to elaborate strategies to contain plague (that was endemic to its territory). Venice was well aware of its role in defending the European continent from the epidemics, to the point that it defined itself "the Barbican of Europe" (Andreozzi, 2015).

The Lazarettos helped the Republic of Venice to enjoy periods of freedom from the infection, therefore they demonstrated that in practice they could protect a city, its social structures and economy from devastation. They were aided by the Venetian fleet, demonstrating that the power of the state was strong enough to enforce the safety measures taken by Venice. They were able to maintain the law and order and prevent attempts of evasion or escape guided by frightened and reluctant sea captains. The example of Lazarettos was imitated by other European ports, such as Marseille, Corfu, Amsterdam, Valencia, Rotterdam and Genoa and Naples in Italy (Snowden, 2019).

2.2.3 Land-based quarantine (sanitary cordons)

Another safety measure born during the Middle ages were sanitary cordons, that acted like land-based quarantine. Once again, a strong state power was required in order for this provision to be effective. The term originated in France in 1821 under the name of *cordon sanitaire* and its adoption was pioneered by Italy, by the cities of Venice, Florence and Milan and later imitated by the rest of Europe.

Sanitary cordons were no-go zones erected around areas struck by plague epidemics. They consisted of military barriers with towers, forts and observation posts. They comprised:

- 1) an outer defensive ring made of armed vessels in the sea.
- 2) a middle coastal ring patrolled by observation towers and forts.
- 3) an inner defensive ring of soldiers (Cliff, Smallman-Raynor, & Stevens, 2009).

The scope of the cordon was the interruption of movement of goods and people from inside and outside of an infected territory. They would be removed once quarantine proved the absence of the illness. The operations, managed by troops, were enforced by weapons as anyone who approached had to be repelled with rifle butts and bayonets and, in case of necessity, shot. Other offenders were tried and sentenced on the spot.

For a long time, European countries managed to isolate themselves. Sanitary cordons were effective in enforcing the regulations and measures against the spread of

plague, so effective that they raised protests because of their oppressive nature. Medical professionals, economists and farmers pushed towards its dismantling (Snowden, 2019).

2.2.4 Measures within the outbursts

In order to confront the infection within, the so-called plague regulations introduced measures and solutions that can be defined, at times, drastic. Apart from therapeutic strategies aimed at the individuals in order to heal them, the cities had to free the streets from the corpses, prevent the infection by cleaning miasmatic air and, above all, enforce the measures. The focus will be once again Italy, due to its contribution and major role in the implementation of the first significant safety measures against epidemics.

Firstly, a problem arose from the multitude of unburied corpses abandoned in the houses and in the streets. According to the miasma theory, decomposing bodies emitted poisonous gases that polluted air and led to the spread of plague. Naturally, they had to be removed and eliminated together with their clothes. In Venice and Florence committees of citizens were recruited to take care of the job and enforce military cordons. These groups would patrol, clean the streets and dig graves and would even spy on other citizens to identify suspicious travellers or alleged cases. Whenever plague reoccurred, these sanitary protocols would be put into place again (Carmichael, 1983). For crimes concerning healthcare, the Republic of Venice accepted complaints reported in secret - essentially "medical espionage" - who reported them were rewarded. Nearby the offices of health authorities, there were wooden boxes that turned into stone openings (called "lions' mouths") where it was possible to leave secret reports. Some crimes that could be reported were e.g. theft of viands from lazarettos, the presence of prostitutes, tramps, beggars, unlicensed sellers of medicines and alleged rotten food on the markets. Another example of "medical espionage" was connected to the prevention of plague, that is to say health authorities could send an individual in a city or state that was allegedly infected by plague. These people had to take as much information as possible and report it to Venice.

Secondly, within pest houses the tense situation of people living in the lazarettos' climate of uncertainty and fear could unpredictably soon spiral out of control. To avoid

this kind of situation, health boards appointed minor functionaries to maintain order. They had a stressful job, being constantly surrounded by hostility and sickness, a combination that often resulted in abusive behaviours, punishing, beating to discipline people. Lazarettos - in particular *Lazzaretto Vecchio* - would turn into instruments of social control, not very different from common prisons (Snowden, 2019). Because the chances to survive the plague were rather low, some priors neglected the infected and profited from the funds that the state paid for their job. The corpses were thrown into mass graves and patient care was so sloppy that at times, allegedly, people that were still alive would be thrown in the mass graves (De Zorzi, 2015). As for cases of neglect that were documented, one reports that in 1458 the Prioress of *Nazareth*, Zentilina, was processed and banned for having fed the patients with spoiled food and to have let some others starve to death. A second case took place in 1482 and involved a prior, Paolo Blanco, was accused of letting adults and children die of hardship, robbing them and selling their belongings that spread plague, and lastly of having stolen the funds from the state. Blanco was sentenced to life imprisonment after he was tied to a pole in a ship wearing a yellow dress (the colour of “ignominy”, that indicated ruffians, prostitutes and jews), carried along the Gran Canal of Venice while his crimes were read out loud (Vanzan-Marchini, 2004).

Snowden (2019: 101) argues that everywhere great infections always caught authorities unprepared. The measures were improvised, chaotic and confused to the point that they can be defined “draconian”. Isolation and confinement forced people to live vis à vis with the sick and death, and punishments would be inflicted in case someone tried to escape. Guards would keep the watch outside the buildings to forbid movements. Actions and operations undertaken to restrain eventual insurgencies of people together with the spread of contagium demonstrate that, during and also after the outbreaks there was a tangible climate of fear. Both the population and authorities would contrast each other on a daily basis, however health commissions demonstrated good skills into the division of power among trustworthy people. This is proven by the fact that, overall, public order and regulations were (forcibly) respected.

2.3 After the Germ Theory: Modern decline in mortality in Europe

During the 18th and 19th centuries Europe witnessed a transformation and an improvement in technological, scientific and societal fields. Inoculation and later vaccination to prevent lethal infections were introduced thanks to the influence of the germ theory of diseases. Bacteria were discovered thanks to the finding of the Dutch weaver Antoni van Leeuwenhoek, that allowed a great leap into the analysis of pathogens. Knowledge of many diseases was deepened, and new measures and solutions were taken to protect the cities, campaign and their population from ailments. Thanks to these transformations it was finally possible to bring constraint forces under control, meaning that human beings could finally manage eventual epidemics in a better manner compared to the past.

From a demographic perspective, the model of population growth changed. The Malthusian model did not apply; however, the demographic expansion followed a “saw-shaped” diagram: as soon as the population started to grow, it would be stricken by crisis including illnesses. The difference laid in the recovery which was quick and that on the whole the population tendentially expanded. Most importantly, plagues loosened their grip on the population at least until the 19th century. Massa, et al. (2011: 162) claim however that the improvement on the demographic trends were not the result of the advancements achieved in the medical field, as the findings did not actually extend the life of human beings. Nonetheless, it can be argued that it constituted a baseline that generated an improvement of general condition of life and, later, thanks to further research in germ theory, finally a gradual extension of life. Moreover, individuals improved personal hygiene and the hygiene of their household. In regard to the advances achieved in the field of diseases, these began with the passage from the miasmatic theory to the germ theory of diseases, with the introduction of inoculation

and later of vaccination. Miasmatic theory still persisted, leading to the emergence of new cleaning rituals and campaigns of filth removal from public spaces³⁹.

Moving forward, the forthcoming analysis of three case-study (smallpox, cholera, syphilis) aims at the provision of a complete insight (of the first two): from the causes, the transformation into a pandemic, to the handling of the diseases in the past and today. What will be analyzed is the origin, how it spread, remedies, measures taken/how it was contained, and a closer look will be dedicated to the interaction of government-population. Each case will be analyzed and it will be reported how (and if) it contributed to the progress in Europe. For the sake of completeness of information, America or other continents might be mentioned too, although the focus is on Europe. For instance, when talking about the role of smallpox, cholera and syphilis in nowadays society, we discuss the efforts implemented on a global level, beyond European borders - e.g. when we refer to smallpox as a warfare threat, America and Russia are the main protagonists.

Case-study 1: Smallpox and inoculation

Smallpox covers a great importance in the study of epidemics, as it can be adopted as a symbol of an epidemic that became pandemic. It was spread from the Old World to the New World. This disease afflicted humanity for centuries and it is the first illness that was completely eradicated from the world (in 1977 the last case was reported, in 1980 the World Health Organization declared it officially eradicated). We will analyze it with reference to its importance for the revolution of medicine and its impact in the implementation of better health measures in Europe, in addition with a brief insight of smallpox as a war weapon.

History

Smallpox was a viral disease transmitted by means of airborne droplets that infect other individuals by entering its respiratory system. Incubation lasted around twelve days and quarantine was effective only if applied early, even before the appearance of the

³⁹ The first reason for improvement in the issue of infections is also biological. Certain pathogens and hosts mutually adapted to each other so that some illnesses became endemic thanks to a newly-acquired immunity after centuries of devastation. The second motivation lays on the progress of society, however this point will be developed in relation to the case-studies of chapter 2.4.

symptoms, which included headache, high fever, back and muscle pain. Subsequently, a rash covered the face, palms and soles of the infected individual that after a few days would turn into pustules. In the cases in which it did not lead to fatality, after eight-nine days the pustules would dry and crust, and the scabs would finally fall off the body within three or four weeks. The survivors acquired long-lasting immunity (but also scars and permanent disfigurement). Possibly an exclusively human disease, its closest animal infections is cowpox and monkeypox. Virology recognizes two kinds of smallpox: *variola major*, with a mortality rate of 25-30% and *variola minor*, which fatality rate was 1% or less. The history of smallpox outbreaks and deaths is related to the first type (Kiple, 2003: 300 et seq). Smallpox only became a major demographic issue during the 16th and 17th century, as during the Middle Ages it was outranked by plague and tuberculosis. Among immunologically naïve populations of the New World it decimated 90% of the population, an overwhelming impact that Webb (2015: 66) calls “American holocaust”.

Eradication

The very first methods to fight smallpox were developed in Africa and Asia, with rudimentary methods of inoculation - also called variolation or engrafting - that consisted of infecting people with the disease taken from other human beings. Some techniques included grinding scabs from victims, alternatively drawing some liquid from pustules of a person afflicted with a mild case of smallpox, and introducing it in the body of a healthy person via inhalation or injection. As for injection, a small cut was opened on the arm of a person to be inoculated, the thread would be inserted and left to soak for 24 hours. The procedure required a preparatory period of several weeks during which the candidate had to follow a strict diet, exercise and rest. The entire process - preparation, illness, convalescence - took around three months to be completed. By means of variolation, the disease was going to be less violent as it is believed that the introduction of the *variola major* virus through the skin does not occur in nature, hence rendering it less virulent. The survivors and the inoculated individuals acquired lifetime immunization (Snowden, 2019: 130-132).

It is thought to have been introduced in Europe by Lady Mary Wortley Montagu (1689-1762), wife of the British Ambassador to the court of the Ottoman Empire who observed variolation while in Istanbul. She returned to Britain in 1717 beginning her advocacy in favour of inoculation⁴⁰, that she supported by having her own daughter publicly inoculated four years later. The Royal Academy of physicians itself was supportive. In the same year, the Princess of Wales became convinced to inoculate her own kids, a decisive event to make inoculation acceptable. In the following decades, variolation slowly spread to other prominent courts, including France, Russia and Scandinavian countries (Manela, 2015).

Inoculation spread mostly among royal families, as ordinary people firstly could not afford it, and secondly, they were distrustful. Vaccination in fact involved the introduction of a pathogen in the body. Watts (1997: 115-116) highlights that indeed for centuries people were taught that the best way to not become ill was to avoid the illness itself. As underlined by Fantini (2014), in this period medicine's role was implemented in the direction of prevention instead of cure and preventive medicine started to affirm its role. The introduction of inoculation produced not only a revolution in the field of science, but also a massive change in the cultural objectives of sanitary politics. When eventually the epidemics started affecting ordinary people's areas they would recur to the inoculation of their families at the hands of unlicensed physicians. For this reason, to this day it is not possible to reconstruct and provide reliable statistics of the percentage of inoculation and its efficacy among ordinary people outside royal courts. The situation began to change with Edward Jenner, who perfected the technique of inoculation. In the 18th century Jenner was practicing medicine in the Gloucestershire town of Berkeley. Here he observed that milkmaids often got infected with cowpox, contracted from the animals they took care of. They would suffer with a mild case of this illness, but later they would not contract smallpox, thus acquiring a crossover immunity to smallpox. Subsequently, Jenner took a further step in his observations, as he convinced his gardener to allow his eight-year-old son to be variolated first with cowpox obtained from an infected milkmaid, and later with smallpox. His experiment was

⁴⁰ In America the practice arrived earlier, thanks to African Slaves. Cotton Mather in Massachusetts heard it for the first time from his slave, as in Africa it was long exercised before its arrival in America and Europe.

successful, thus he decided to inoculate a series of children, who too resisted the infection (Hays, 2009: 125-126).

In 1803 in the London Tavern was constituted the *Royal Jennerian Society for the Extermination of the Small-pox*⁴¹. It was patronized by the Prince and Princess of Wales and aimed at the eradication of smallpox by means of inoculation. The manifesto described the severity of the illness, the way inoculation worked and what it provoked, and expressed the members' awareness of prejudices and ignorance towards the practice and also of the "imperfection of the art", nevertheless encouraged people, especially parents, to trust it⁴². Jenner called the whole procedure to obtain immunity from smallpox "vaccination", from the Latin word for cow (*vacca*). He credited the invention of this term to his friend, the physician Richard Dunning. Jenner published a detailed assessment of vaccination in his majestic work *An Inquiry into the Causes and Effects of the Variolae Vaccinae, a Disease Discovered in Some of the Western Countries of England, Particularly Gloucestershire, and Known by the Name of the Cow Pox*. Despite the efforts employed along those years, an efficient and definitive advocacy for the complete eradication of smallpox only began two centuries later.

After a long history of opposition⁴³, in 1959 WHO initiated a campaign for the eradication of smallpox from humanity. Due to the lack of collaboration in terms of funds, investments and personnel the program could only begin almost ten years later, in 1967, under the name of "Intensified Eradication Program". Before the beginning of the campaign, it was estimated that smallpox infected 10 to 15 million individuals per year. By the time the program was initiated, however, smallpox had already been eradicated from wealthy societies located in temperate areas of the world, namely North America (1952) and Europe (1953), thanks to strong governments and more skilled medical professionals. South America was added to the list of smallpox-free countries in 1971, to which followed Asia in 1975 and finally Africa in 1977. The more

⁴¹ Original broadsheet available at:

<https://collections.countway.harvard.edu/onview/scripto/transcribe/13019/2028>

⁴² Full manifesto of the Society available at: <https://books.google.it/books?id=rhY6AQAAMAAJ>

⁴³ See chapter 2.4.2., letter a)

intense outbreaks burst in tropical countries as the vaccine was weaker, due to heat. The innovation of freeze-drying occurred in the 1940s, twenty years prior to the launch of the worldwide campaign of WHO.

The last cases took place in the 1970s and 1980s. The very last known case of *variola major* occurred in 1975 in Bangladesh, where a three-year-old girl acquired the disease naturally. She was isolated in her home with guardians outside at the entrance. Within 1.5 miles (2.4 km) radius a house-to-house eradication campaign began, involving public and private spaces. Whoever reported a case of infection was rewarded. On the other hand, the very last case of *variola minor* acquired naturally occurred in October 1977 in Somalia. The last death due to smallpox happened in 1978, at the Birmingham University Medical School in England. Here the forty-year-old medical photographer Janet Parker worked one floor above the Medical Microbiology Department where smallpox research was being conducted. She was not diagnosed until nine days after she developed the typical rash and she died a month later after contracting it. An investigation was opened, and it was hypothesized that the woman had been infected either through the duct system or by direct contact while she was on the floor above⁴⁴. Nowadays, if a case of smallpox occurs it is taken very seriously. It would be a health emergency of public concern, and state health officials must be notified as soon as possible. The confirmation of the diagnosis would take place in a laboratory which biological safety is the highest, namely BSL-4⁴⁵, and the scientists that work on the sample must have been vaccinated (Breman & Henderson, 2002).

Warfare threat

Despite all the efforts employed to eradicate smallpox, this disease can still represent a threat to nowadays' society, as it could be employed as a war weapon. The Centers for Disease Control and Prevention (CDC) ranks three categories of illnesses that are considered potential threats for biological terrorism, divided in category A, B and C. The first group comprises smallpox, anthrax, tularaemia, plague, botulism and viral

⁴⁴ <https://www.cdc.gov/smallpox/history/history.html>

⁴⁵ For more information about laboratories' safety levels see chapter 3.3, letter c)

haemorrhagic fevers⁴⁶. Riedel (2004) reveals that the first use of smallpox as a biological weapon occurred in the New World. Firstly, one believes that the Spanish conquistador Francisco Pizarro (1529-1541), who led Spanish expeditions to conquer Peru, distributed contaminated clothes among natives. Secondly, another case suggests that the British commander Sir Jeffrey Amherst contaminated the aborigines in order to tackle their hostility. In 1763 one of his subordinates distributed variola-infected blankets from the smallpox hospital to natives, causing a large outbreak among the indigenous populations in Ohio River Valley. This last case is confirmable by the evidence reported in the diary of one of Amherst's subordinates, who stated that he was hoping to obtain (by the distribution of infected blankets) the "effect he desired"⁴⁷. Thirdly, an outstanding event that took place in 1776 witnessed 5000 out of 10000 Continental Army soldiers in Quebec who became ill with smallpox. Allegedly, the responsibility falls on a British commander who possibly spread the illness by means of recently variolated civilians, who were sent into the soldiers' encampments. The commander died of smallpox and his forces retreated southward later that same year. It is argued that thanks to this defeat the status of the northern British colonies was preserved, allowing Canada to become a separate country⁴⁸. Last, another case reported by Riedel (2004) took place during the American Civil War, as Confederates sold clothes contaminated with smallpox (and yellow fever) to Union troops in 1863.

When smallpox was definitively eradicated at the end of the 1970s, WHO ordered the destruction of all stocks of variola virus around the world. Two countries still held stocks of the virus: Russia (at the Institute of Virus Preparations in Moscow) and the US (at CDC in Atlanta, Georgia), for which the WHO in 1998 agreed to keep stocks for research purposes (Riedel, 2005). In 2001, the Twin Towers attack triggered a new fear for diseases employed as biological weapons by terrorists. The Kazakh-

⁴⁶ Group B includes: brucellosis, glanders, ricin toxin, typhus fever, Q fever, staphylococcal enterotoxin B, viral encephalitis (alphavirus: VEE, EEE, WEE) and water safety threats (e.g., **vibrio cholerae**, cryptosporidium parvum). Group C contains emerging infectious diseases such as Nipah virus and Hantavirus. (Riedel, 2005)

⁴⁷ To read more about Europeans-native americans hostilities, see also *The Indian wars of Pennsylvania*, by C.H. Sipe (available at <https://books.google.it/books?id= kUIAwAAQBAJ>).

⁴⁸ https://www.historyofvaccines.org/timeline#EVT_42

American physician, microbiologist, and biological warfare expert Ken Alibek (born 1950) expressed in 2004 his concerns towards determinate scientific research performed in Russia. Since the 1930s, Russia cultivated the virus in chicken embryos for the purpose of making it more efficient and productive. Despite signing in 1972 the *Biological Weapons Convention* of the United Nations, in the 1980s Russian scientists achieved the development of a “reactor-based smallpox biological weapon in liquid form”. Alibek recommended therefore to always be alert and ready to address eventual threats of bioweapons attacks and implement effective countermeasures (Alibek, 2004).

Conclusions

Smallpox is a disease that recurred along the history of humanity up until the 20th century. Its eradication was a milestone reached after a long story of misinterpretations of the history of illnesses, and its achievement symbolizes a great step in the progress of humanity and research. A definitive, complete eradication from the society meant the end of huge outbreaks and, perhaps, the avoidance of other human population extinctions. Smallpox symbolizes an era of progress not only in epidemiological fields. Its case demonstrates that scientific progress alone is not enough as the eradication of smallpox was achieved above all thanks to political synergies at an international level, as it took two centuries of intense medical, moral, social, cultural and political debate. In addition, smallpox is the promoter of the invention of modern vaccines and, finally, is one of the ailments that represent the passage from epidemics to pandemics. It is however important to always stay alert, considering that it was used as a biological weapon in the past. For these reasons, it is possible to affirm that smallpox did disappear from society, but not from the world, where it is still latent.

Case-study 2: Cholera and water infrastructure

“Nulla est religio in stagnum”: there is no religion in a lake (Ranger & Slack, 1992: 62).

Cholera is a disease which roots date back at least at the time of ancient Greece. The first time it appeared in the Hippocratic treatises, which *Corpus* sometimes refers to “diarrheal disease”. This illness drained the victim who eventually died of extreme shock, and was a mystery for a long time. Seemingly, its first appearance and

disappearance were not very well defined. The scientific progress led to the discovery and isolation of the comma-shaped bacterium that caused it, which in turn shed a light on the squalid infrastructures of the cities of the 19th century. Cholera also triggered the first international agreements on quarantine. Nowadays it appears that the epidemics that occurred in the West before the 19th century were either endemic or sporadic and were not brought about by the *Vibrio cholerae*. Nevertheless, we will follow the scholars' reasonings and definitions that associate the seven epidemics in history with said bacterium, developing the peculiarity of the case of London, where the threats generated by cholera proved that the city allegorically located itself halfway between Middle Ages and modern time. We will also see the management of the infection in contemporary times.

History

Cholera is an acute diarrheal disease generated by the bacterium *Vibrio cholerae*. It is limited to the intestines and does not affect other body tissues. The bacteria clings to the intestinal tissue and secretes a toxin that causes water and salt (electrolytes) to not be absorbed by the body. Consequently, the body will discharge several litres of water in a single day, resulting in severe dehydration, and, due to lack of hydration and electrolytes, weakening, thickening of the blood, suppression of urination, loss of fluids of tissues (cyanosis), muscular spasm and at the end fall in blood pressure, loss of pulse resulting in shock and, eventually, death (Kiple, 2003: 74-78).

Cholera can be considered a mystery. For two millennia it was limited to India and all of a sudden it became pandemic. Again, after its arrival in Europe, it disappeared for centuries and reappeared in the first half of the 19th century. There have been seven cholera pandemics from the 19th century to this day, with the very starting point located in the Ganges River delta in India. The first pandemic started in 1817 and lasted six years. The second pandemic began in 1829 and lasted twenty years, spreading to Europe and from there to the Americas by immigrants. The third wave started in 1852, lasted seven years and involved Asia (it generated in India), Europe, North America and Africa. Two years after the wave started, the bacterium was observed by the Italian anatomist Filippo Pacini (1812-1883). The fourth pandemic generated the Bengal region and

spread to the Middle East and again arrived in Europe, Africa and North America. The fifth pandemic, beginning in 1899, also generated in the Bengal region of India and moved across Asia, Africa, South America and parts of France and Germany. This time, Great Britain and the United States managed to avoid it thanks to John Snow's findings that kept cholera out of those areas. The sixth wave took its biggest toll on India, but reached other areas too, namely the Middle East, Northern Africa, Russia and Europe. It ended in 1923, although by that year it had already backed off from a great part of the world, persisting however in India. Currently, the last cholera outbreak generated in Indonesia and mostly plagued less developed countries across Asia, the Middle East and Africa. Two years after it arrived in the African continent the pandemic spread - by 1973 - to Italy too. The last, more recent severe outbreaks took place in Rwandan refugee camps in the Democratic Republic of Congo in 1994, taking away several thousands of lives. In the 21st century, in 2008 in Zimbabwe an outbreak caused by deteriorating infrastructures killed around 500 people. Last, the Haiti earthquake of 2010 generated an outbreak of cholera that killed around 250 people in October of the same year⁴⁹.

Vaccination and cure

The discovery of the causative pathogen was a disputed issue for a long time. In 1854 the Italian anatomist Filippo Pacini managed to observe the cholera bacterium in intestinal contents of some victims. He produced a report with the title *Osservazioni microscopiche e deduzioni patologiche sul cholera asiatico*⁵⁰ that he exposed in Florence in the same year. Nevertheless, his observations and findings did not arouse interest. It happened only in 1883, after Robert Koch managed to isolate the *Vibrio cholerae*, and just like Pacini he described the causative pathogen. The acknowledgments for Pacini's findings came to him only 82 years after his death (Kiple, 2003: 74-78).

Louis Pasteur (1822-1895) was the scientist who provided effective empirical evidence to revolutionize medical science, and he applied his findings to cholera disease.

⁴⁹ <https://www.cbc.ca/news/technology/cholera-s-seven-pandemics-1.758504>

⁵⁰ The full document exposed by Pacini is available at:
http://badigit.comune.bologna.it/books/pacini/scorri_big.asp

Pasteur developed an alternative theory to the zymotic theory⁵¹ and the “spontaneous generation⁵²”: he focused on the problem of French wine that fermented into vinegar, demonstrating that it was not the product of a chemical process, rather a bacteriological process. To destroy the bacteria, he discovered a procedure that he later called “pasteurization”, during which a certain level of heat was applied. This way the bacteria would be destroyed, avoiding the process of fermentation. Thanks to this experiment he was able to prove that some diseases, for instance cholera, were not generated by a specific climate (miasma) but instead by the importation of the specific bacterium - a *bacillus* - that causes the outbreak. Moreover, Pasteur was able to apply the pasteurization process to the struggle against diseases. Snowden (2019: 251) states that it was thanks to him that public health practice of vaccination was developed as, contrary to Jenner, he managed to attenuate the virulence of the pathogens before introducing them in the human body. The way to attenuate it was pasteurization, and to explain the process he resorted to an agricultural metaphor, where a succeeding crop cannot flourish, as the nutrients of the soil were exhausted by the previous one. Likewise, an attenuated virus would consume the nutrients of the blood leaving a sterile ground deprived of nutrients necessary for the same, but more virulent, disease. Another difference from the innovation of Jenner was that Pasteur was able to apply the principle of vaccination against a broader range of pathogens. As a matter of fact, one managed to provide vaccines for problematic diseases such as measles, pertussis, tetanus, diphtheria, typhoid, rabies and polio. A problem arose with cholera (and malaria), which required further research. After experimenting a culture of bacteria on chickens, he discovered that heat attenuated the virulence of the virus, coming to the assumption that virulence of bacteria could, in fact, be weakened.

⁵¹ See chapter 1.2.4.

⁵² “Spontaneous generation”: idea, held since antiquity and submitted by Aristotle, that argued that living organisms could arise from inanimate material and did not descend from parent organisms of the same type. Francesco Redi (1626-1697) tested this idea by putting meat and fish into several open and closed flasks. He observed that maggots pollulated only from the open flasks and would not get close to the sealed ones. He deduced that maggots appeared only under the condition that flies were able to deposit eggs, thus it was not possible for unanimated matter to generate life. This view became finally accepted only two centuries later, during the time of Pasteur. (Snowden, 2019: 247)

As for cholera treatment, it took almost seventy years to be fully and successfully developed. The first attempts occurred in the 1830s, when water and later salt and water were injected in patients, with little to no success. The British Leonard Rogers (1868-1962), a tropical medicine enthusiast and a founder member of the Royal Society of Tropical Medicine and Hygiene, perfected the treatment against cholera in Calcutta in the early 1900s.

Water infrastructures

In the 1830s the medical apprentice John Snow (1813-1858) was sent by his master to Killingworth colliery to help dealing with an outbreak of cholera. After he became medically qualified, Snow moved to London where he focused on the study of epidemiology, resuming his findings made almost ten years earlier. By making inquiries about the habits of the miners, he learned that the men usually handled their food and drinks with unwashed hands, which raised some doubts about the applicability of miasma theory, considering that there were no sewers, swamps or cesspools underground. Since bad air could not be the issue, Snow hypothesized that cholera was spread by particles located on the hands of the miners. He linked this issue to the slums of London, plagued with cholera. Dirty bed linen would infect the hands of the person who checks on the sick person. From their hands they would then pass to their mouth and on the food handled and prepared for the rest of the family. Moreover, working class families had their meals in the same room of the ill person, thus the contact was close and almost continuous. The infection spread easily from the household to the rest of the city as cholera evacuations would permeate the ground and penetrate into the wells, or into the rivers from which townspeople would collect water for their everyday errands. This way, the disease reached both the households of the poor and the rich. In 1849 an outbreak struck the houses of Golden Square and its surroundings, where the inhabitants collected water from surface wells. In August, a severe outbreak killed 500 people in ten days in a limited area on Golden Square, and in a nearby road - Broad Street - an outbreak exploded suddenly on the evening of 31st of August to the 3rd of September. Snow examined the registers and mapped the cases of cholera, and they all seemed to reconduct to Broad Street Pump. He took a further step by interviewing the residents and found out that those who preferred to draw water from the pump of Main

Street got ill. Snow managed to have the authorities to remove the handle from the pump and achieved an important discovery, namely that cholera was a water borne disease⁵³.

Just like it happened to other scientists, John Snow was initially distrusted by his contemporaries, until the year of his death. That same year marked a turning point. In fact, in the summer of 1858 an event that finally marked a breakthrough into sanitary reforms took place: The *Great Stink*. Essentially the hot summer of that year caused the unclean waters of River Thames to emit such an overwhelming smell that members who would meet in the Houses of Parliament nearby could not even achieve any work and carry on with their business. The absence of a sewer system meant that River Thames had to cover that role for the entire city of London. The artist William Heath (1794-1840) defined River Thames a “monster soup”, a mix of untreated human and industrial discharge and slaughterhouse effluent, that created a thick layer of obnoxious foul-smelling lime on the foreshore. The *Great Stink* was the episode that triggered the decision of the Parliament to definitively create a unified sewage system for the city of London by passing the *Thames Purification Bill*. The project was assigned to the British engineer Joseph Bazalgette (1819-1891), chief of the Metropolitan Board of Works (MBW), the main board that preceded the London County Council of 1889 and provided for the infrastructures of the city. The MBW was assigned full responsibility to clean up River Thames, borrow the massive sum of £ 3 million (that doubled by the end of the project) and, finally, build an efficient sewage system. By the 1870s the core London sewage system was created, consisting of almost 2000 kilometres of street sewers and with 130 kilometres of main sewers. They both collected sewage and rainwater. When the project was done, cholera - that was already receding - started disappearing from London⁵⁴. Balzagette also formed other engineers and gave advice not only to other British locations but also to cities such as Budapest and Port Louis, Mauritius⁵⁵.

⁵³ <https://www.ph.ucla.edu/epi/snow/snowcricketarticle.html>

⁵⁴ <https://heritagecalling.com/2019/03/28/the-story-of-londons-sewer-system/>

⁵⁵ http://www.bbc.co.uk/history/historic_figures/bazalgette_joseph.shtml

In 1851, on the initiative of the French government, the first of 14 International Sanitary Conferences began. It brought scientists and diplomats together and had a tendentially political agenda. The aim was the standardization of quarantine regulations in order to avoid the international spread of cholera (and also plague and yellow fever). An initiative was finally delineated only during the 7th conference, in Venice, as it was established that ships arriving across the Suez Canal had to undergo quarantine in case there was one or more suspected cases of cholera. Suspected vessels were not allowed to pass without an inspection unless they sent a telegram informing the ports that they were provided with medical assistance (a doctor was enough) and a disinfecting machine on board. To make the passage more secure, emphasis was placed on bacteriological tests and disinfection. The quarantine in the Suez Canal represented a gate between the Orient and the Occident, open for commerce, closed for diseases. Countries were invited to pay particular attention to specific groups of people, namely gypsies, emigrants and individuals whose work led them to travel back and forth across the countries' borders. In 1909 the *Office International d'Hygiene Publique* was opened in Paris. Cases of cholera had to be reported there (Huber, 2006). Cholera issue (and other diseases) emerged again after the two World Wars, and in 1969 the WHO created the *International Health Regulations* (IHR)⁵⁶.

21st century's global efforts

Sustainable Development Goal #6 of WHO recalls "Ensure availability and sustainable management of water and sanitation for all". The organization supports and promotes the global prevention and control of cholera as, especially in the tropical areas, it still represents a threat that can easily turn from a limited epidemic to a pandemic in a very little time as we live in a globalized world, where everyday millions travel for business, tourism, and migration-related reasons.

In the most recent years, the Global Task Force on Cholera Control (GTFCC) was revitalized and in 2017 an unprecedented action to end cholera began, under the name of "Global Roadmap". This operation provides a strategy to implement between 2017

⁵⁶ The original document of 1969 is available at:
<https://apps.who.int/iris/bitstream/handle/10665/96616/9241580070.pdf>

and 2030 to control the disease and reduce its fatality by 90%. The GTFCC pursues this aim thanks to the commitment of cholera-affected countries, donors and technical partners. One of the tools used in 2018 was the administration of more than 12 million doses of oral cholera vaccine in 11 countries, 2 million more than the doses delivered in 2017⁵⁷. The GTFCC and WHO keep working in order to improve coordination and cooperation between countries on a global level, provide support, guidelines and manuals to manage the operations, mobilize resources, support the research agenda to enhance prevention and control, and advocate in order to increase awareness about the seriousness of cholera (Tulchinsky, 2018).

Conclusions

Cholera has been a very invasive and scary illness that exploded in seven pandemics in the course of the last three centuries. The identification of the cause, the virus and a cure required a long time and several great minds and experiments. Unfortunately, once again mistrust and ancient diseases theories stood as a massive obstacle between cholera and its demise, which required more time and efforts than it was necessary. Its persistence triggered an evolution in the society and infrastructures, leading to the building of a sewer system in the stench-permeated city of London. New sanitary infrastructure and the assumption that one of cholera's carriers were hands meant a new awareness about cleanliness and hygiene. Cholera also triggered the first international agreements on quarantine. This disease disappeared from the richer countries but to this day it still affects poorer states, usually located in tropical areas. The Task Force of 2017 in fact demonstrates that this illness is still an important threat that afflicts several poor countries (for example after the 2010 earthquake in Haiti) and that can turn into a global pandemic quite rapidly.

Case-study 3: Syphilis and influence on leaders

Syphilis is one of the most dreaded sexually transmitted diseases. Its peculiarity lies in several factors. First, syphilis - or the Great Pox - can remain latent for three to thirty years contrary to other well-spread epidemics that used to kill in a matter of days

⁵⁷ https://www.who.int/cholera/task_force/en/

(smallpox) or hours (cholera). Secondly, in the past it was often confused with a large number of other diseases, which is also a reason why its origin was and is still disputed. Thirdly, syphilis can be a monumental although invisible factor that might have shaped decisions of some of the most terrible rulers along history. A brief insight will be also dedicated to syphilis prevention today, the second cause of stillbirth in the world.

History

Syphilis is a disease caused by the spirochaetal bacterium *Treponema pallidum*. There are two forms of syphilis, namely venereal and non-venereal, and the same bacterium is most likely the cause of other illnesses similar to syphilis (e.g. pinta and yaws). By a superficial examination, it can be mistaken for another disease that causes similar symptoms, but it was finally given its proper identity when the germ was isolated in 1905 by Fritz Schaudinn (1871-1906) and Erich Hoffmann (1868-1959), as syphilis was finally diagnosable by the “Wassermann test”. Its ambiguity earned it the nickname of “Great Imitator”, allegedly assigned by the Canadian physician Sir William Osler (1849-1919), who observed that “in its late stages it simulates almost every disease known to man” (Meyerhoff, 1976).

Syphilis develops in three phases. Firstly, after an incubation of two to six weeks a small, painless chancre (ulcer) appears usually in the genital area. Its aspect is similar to a pimple, thus sometimes it goes unnoticed. After a period of one or one month and a half circa the symptoms of the secondary stage appear. They consist of ulcers disseminated on the skin and internal organs, accompanied by a general feel of discomfort caused by headaches, mild fever, bone aches, most likely a sore throat and also a painless rash, which aspect and localization varies. The skin rash is not a syphilis distinctive trademark, it can in fact be mistaken for any skin disease - even for measles and smallpox. The last stage, tertiary syphilis, appears after a long time and in only one third of untreated cases. From one up to twenty years⁵⁸ syphilis may be latent, settling

⁵⁸ Time spans vary based on the author. I.e., Kiple (2003: 314) states that the incubation is 2 to 6 weeks and the third stage develops after one to twenty years. On the other hand Cartwright (1972: 54, 56) argues that the incubation period lasts “from ten to ninety days, usually two to four weeks”, and the tertiary syphilis appears after “three to ten years [...] but often at an even later date”. Arguably, the first source

thus in chronicity. This last stage involves a typical lesion - a sort of benign tumour - called gumma, that can develop anywhere: skin, internal organs, bones, heart. Serious forms of syphilis lead to the decay of the central nervous system - the patient becomes paralyzed, incontinent, or acquires a form of insanity called general paresis (GPI)/dementia paralytica - or of the cardiovascular system - the affected individual can develop an aneurysm or dilatation of valves (Kiple, 2003: 312 et seq. Cartwright, 1972: 54 et seq).

To treat syphilis, methods changed along the centuries. The early treatments used in the 16th century were popular remedies based on guaiacum, called "Holy Wood", that came from the New World. Later, this method was replaced with mercury. Mercury was often administered in the form of pills and caused profuse salivation (sign of poisoning) which was thought to help remove the poisons (the bad humors) of the disease. This aim was achieved also by means of sweat baths. A final cure was introduced in the 20th century with penicillin, thanks to John Mahoney (1889-1957), that could heal both venereal and non-venereal syphilis (Frith, 2012).

The origin of syphilis is still debated, proved by the many names given to it along the centuries: the French/Polish/Neapolitan disease, Canton disease (in China), Chinese disease (in Japan), Frenchpox and Great Pox (in Great Britain), Spanish diseases and *la grosse vérole* (in France). There are two theories about its origin. The first one argues that from America (the West Indies) it arrived in Europe by ship in 1493, during the years of the first great explorations. Twenty-five years later a book printed in Venice reported that a "Spanish disease" was imported from America by Colombo and his seamen. After this book, many other sources stated that a greatly virulent disease effectively appeared in Europe when Columbus returned. The second theory maintains that syphilis actually had its origin in Africa and was brought to Europe - firstly into Spain and Portugal - by Spanish and Portuguese slave traders. If we give credit to the second hypothesis, then the first complications with syphilis arise. In Africa there is a tropical ailment that is, for some aspects, very similar to syphilis and the two might have been often confused with

might be more reliable as it is the Cambridge Historical Dictionary of Disease - moreover, it is a more recent source. In this thesis we rely on Kiple's datas.

one another. It is called yaws and can be found in hot climates. It is not a venereal illness as it is transmitted by skin-to-skin contact. For this reason, it is common in areas where clothing is rarely used and especially among children below 15 years old. It attacks skin and bones and is caused by a bacterium that is a subspecies of *Treponema pallidum* - the bacterium that causes venereal syphilis⁵⁹. When introduced to Europe, this illness transitioned, muted and settled down into venereal syphilis. The reason that explains the cause of such a great contagious rate in Europe during the 16th century could be indeed this - that initially it could be developed by non-venereal contact. This included drinking from the same cup, a kiss on the mouth and other non-venereal contacts. Despite numerous theories, syphilis' origin and spread in the past remains a controversial topic.

Influence on leaders' decisions

This part aims at stimulating a reflection about the monumental influence that syphilis might have had on country rulers in the past. Instead of the analysis of eventual improvements on science or infrastructure, we will shed a light on how a disease that affected the highest office in the land could still indirectly affect the well-being of citizens or even represent a threat for their life.

Syphilis developed in three phases. The third one is the most lethal, as cardiological complications or central nervous system problems may occur, including GPI. In the past there are some cases of dementia reported among great leaders, for example Ivan the Terrible and Henry VIII. In Europe, more precisely in England, the case of Henry VIII is controversial. Some writers assume that he was not syphilitic, others argue the opposite. Herein the second hypothesis will be taken in consideration and we will analyze King Henry VIII's performance from the perspective of venereal syphilis' influence.

King Henry VIII has a reputation of an egoistic man, a heartless human being who only used women to obtain an heir, getting rid of them once his plan was not achieved or achievable. The hypothesis analyzed herein is that besides from his education and

⁵⁹ https://www.who.int/neglected_diseases/diseases/yaws/en/

upbringing, what could have gravely affected the king's behaviour might have been syphilis disease. Cartwright (1972: 54 et seq) describes remarkable cases of great leaders who, due to tertiary syphilis, might have acted the way they did later in their age. Henry VIII's health problems marked a turning point in the history of the English nation. First of all, the scholar highlights that Henry's children showed tracts of congenital syphilis. Elizabeth, the daughter of Anne Boleyn, might have been sterile. Mary, the daughter of Katherine of Aragon, was short-sighted, was probably partially deaf, and her nose, which emanated a foul smell, had a flattened bridge - both typical signs of congenital syphilis. Neither Mary nor Elizabeth produced an heir. A child of Mary and her husband (who died early) would have been the heir of three countries, namely England, Scotland and France and one can only wonder what the future of Europe could have been. Also, Edward, born from the marriage with Jane Seymour, did not live a healthy life. He suffered from a skin rash in the last months before his death, combined with necrosis of his toes and fingers' top joints. The clinical situation pictures a possible combination of congenital syphilis together with another illness (pulmonary tuberculosis).

Cartwright then moves the focus on Henry VIII himself. Considering the importance that the king attributed to producing an heir, then the only considerable reason why after a certain point of his life no records of either live birth, stillbirth or miscarriages were registered, was that towards his midlife he became sterile, a point in favour for the hypothesis of syphilis. The historian David Starkey (born 1945) shades a different light on the king's behaviour, stating that it all began due to the way he was raised, that is in a female household - far from a paternal figure. Starkey defines Henry VII a poet, and argues that it is possible to understand his psychological tracts from his upbringing:

“There are only two reasons why a man marries six times. One is that he doesn't take marriage seriously at all. The other is that he takes it too seriously. He has this [...] belief, that marriage and love are the same thing. I think that's very clearly associated with this feminised upbringing. Henry likes women.⁶⁰”

⁶⁰ <https://www.historyextra.com/period/tudor/young-henry-viii-what-like-as-child-childhood-boy-david-starkey/>

Without wondering about the possible questionability and bias of Starkey, the only reflection of his work that is worth considering is the delineation of “two” different men: a young (and kind) and an older Henry. During his years of youth Henry had smallpox, recurring episodes of malaria and suffered twice from injuries reported while jousting (one of which left him unconscious for two hours). He began suffering from headaches, developed ulcers on his thighs and started to binge on food and drinks, developing diabetes⁶¹. His insanity developed in the 1530s. He decapitated his second wife, Anne Boleyn, instead of simply divorcing her (considering that he was the Head of Church of England), declared his daughter a bastard, suppressed monasteries and hanged their abbots. These years were marked by physical suffering, and his insane behaviour is linkable to tertiary syphilis.

Remarking the point that it is one of the many hypotheses, syphilis could be one, perhaps the easiest, explanation of Henry VIII’s madness in his middle ages, due to its great spread in the 16th century. What can in fact raise suspects are the characteristics of the king’s three kids and his own illnesses that included headaches, sore throats, pains, ulcers and, lastly, his sterility.

Preventing stillbirth

Nowadays, syphilis represents the greatest problem when it comes to pregnancy. It is indeed the second leading cause of stillbirth on a global level, taking into account that according to estimates stillbirths are around 2.6 million each year. Premature death is classified as stillbirth if it occurs after 28 weeks of pregnancy. On the other hand, when fatality does not occur, syphilis causes prematurity, low birthweight, neonatal death, and infections in newborns. These losses are avoidable by running a test and applying a treatment based on benzathine penicillin⁶².

In 2014 WHO agreed on the implementation of “Every Newborn Action Plan” (ENAP) that aims at the reduction of stillbirths to 12/1000 in every country by 2030. In 2019, 128 out of 198 countries reached the target, nevertheless the problem is that the

⁶¹ <https://www.historic-uk.com/HistoryUK/HistoryofEngland/Henry-VIII-Health-Problems/>

⁶² <https://www.who.int/data/gho/data/themes/sexually-transmitted-infections>

success mainly concerned high- and upper middle-income countries. Just like it is happening with cholera, the low-income countries are the ones that are suffering the most, with 84% of stillbirths. According to the WHO's report of 2019, it is calculated that out of the circa 140 million births that will occur per year by 2030, a total of 26 million newborns will die. By means of implementation of policies, programmes and technologies at least 1.5 million deaths can be prevented, but this requires a very intense effort: essential medicines and commodities must be made available to all countries. Moreover, states must comply with clinical interventions and practice based on evidence, all combined with appropriate hygiene infrastructure and a staff that needs to be not only competent but also motivated. Finally, solid documentation and use of information are necessary as well⁶³. UNICEF works in pair with WHO to increase awareness, reduce stigma, support women and their families, improve the health system and identify the target states⁶⁴.

Conclusions

Syphilis represented a great unknown: just like cholera and smallpox, the breakouts always caught everyone unprepared. It took time before it was fully understood, as its bacterium mutated according to the environment in which it was imported. The symptoms appeared to be very random. They could be confused with other illnesses and in addition they did not appear all together but essentially all along the lifespan of the individual. The first methods to prevent - mercury - helped heal but poisoned the patient, in this sense the scientific revolution was fundamental to find a cure for syphilis too.

Additionally, it is safe to affirm that apart from consequences in infrastructure or scientific reforms, a disease should be analyzed from another point of view, i.e. its direct influence on the history of the country or even the world itself, considering the chain reactions that the actions of such powerful leaders triggered, as we could see in the case of Henry VIII (and his children). One cannot help but wonder whether the future

⁶³ <https://www.who.int/publications/i/item/9789240005082>

⁶⁴ <https://www.who.int/health-topics/stillbirth>

of Britain, Europe and perhaps of the world would have been shaped differently, had syphilis not occurred in some important rulers. Nowadays, syphilis still imposes a burden on the world, being the second leading cause to stillbirth. Just like the case of cholera, a fair dose of caution should always be applied even to those diseases that do not scare the community anymore like they used to, as they still exist and still affect some areas of the world, especially the poorest.

2.4 Reactions of people

2.4.1 Before the germ theory

While on one hand the state applied its first - I would say - experimental measures against the epidemic, among the population, whose education was very limited, the contemplated reasons for the plague epidemic that gave rise to strong reactions were two: divine wrath and contaminated atmosphere that triggered an imbalance of humors. It is hence a direct application of the theory of humors and miasma. However, it is the divine anger that prevailed among regular people, leading to behaviours and actions explored by Snowden (2019: 82 et seq), Hays (2009: 77-87), Sidky (1997) and Preto (1987)

a) Sinners and sins

According to people, God was purging the community and everyone had to contribute and help him. Therefore, a ruthless “sinners hunting” began which was nothing but a search for a scapegoat that could be used to exorcize common fears. Sidky (1997: 256) explains that witch hunting was essentially

“[...]a movement to restore order in a time of profound crises. The process of detecting, exhibiting, and ceremoniously destroying Satan’s baleful agents conveyed the message that society was not out of control after all, that the majesty of the law reigned supreme, and that the Almighty was indeed in heaven. Scapegoats offered easy answers and thus spared people from having to come to terms with the real reasons for their social, economic, and political woes”.

Several individuals were beaten, imprisoned, expelled from the city and, in the worst of the cases, stoned, lynched or burned at the stake (fire was the element indicated in the Bible as the purificator⁶⁵). The targets were Jews (through what would nowadays be called “ethnic cleansing”), prostitutes, foreigners and alleged witches. The most well-known treatise on witchcraft was the *Malleus Maleficarum* (Eng.: “hammer of witches”), written by the Catholic clergyman and inquisitor Heinrich Kramer (c. 1430 – 1505). Being old, ugly or having a skin mark (the “devil’s mark”) were the most relevant physical proofs that demonstrated a collusion with the devil. On the other hand, behaviour evidence was considered to be the lack of eye contact, stuttering, trepidation and tears (or even the lack of them). Confessions were released as a consequence of torture. These individuals were inflicted tortures that were extremely cruel. The scholar quotes the statements of Frederick von Spee, a priest who acted as the confessor for “witches” in the 17th century in Würzburg. The priest reported that the tortures were so cruel that many condemned people would die due to their injuries, others became disabled, and still others had their body so mangled that during their beheading the executioner would not uncover their shoulders.

During the plague epidemic of 1630, especially in Milan, the fear that plague was artificially created and spread on purpose by some individuals, called *untori*⁶⁶, emerged. Accordingly, some people would spread the infection by oiling objects (ex. pews, doors, handles) or spreading “dust” that contained the plague. Anyone could be targeted: women, men, politicians, beggars, medics, as any action could be interpreted maliciously. For instance, standing still next to a well or to a door could be suspicious, as well as a normal action such as tidying one’s clothes up. The unfortunate person who was targeted was arrested and, in the worst of cases, lynched by bystanders. There are

⁶⁵ See 1Cor. 3:10-15: “10 By the grace God has given me, I laid a foundation as a wise builder, and someone else is building on it. But each one should build with care. 11 For no one can lay any foundation other than the one already laid, which is Jesus Christ. 12 If anyone builds on this foundation using gold, silver, costly stones, wood, hay or straw, 13 their work will be shown for what it is, because the Day will bring it to light. It will be revealed with fire, and the fire will test the quality of each person’s work. 14 If what has been built survives, the builder will receive a reward. 15 If it is burned up, the builder will suffer loss but yet will be saved—even though only as one escaping through the flames.”

⁶⁶ Eng.: “plague-spreaders”. The Italian word *untore* stems from the verb *ungere*, that means to oil/grease.

two theories about plague-spreaders: the first links them to political and economical interests, e.g. take possession of someone's belongings or get rid of an influential person, the second to pacts with the devil, i.e. killing people just for the sake of it (Preto, 1987). A case of trial for "plague-spreading" took place in Italy in 1630, when Milan's commissioner of health was seen smearing some houses with ink. Some women, who saw him doing so, accused him of smearing the buildings with "plague poisons". The commissioner was arrested and tortured and the sufferings led him to confess whatever he was asked. Consequently, he accused a barber of being his accomplice who, in turn, after being tortured as well, accused another man. The latter, the son of the fortress' commander, was absolved, whereas the health commissioner and the barber were executed (Sidky, 1997). As for Jews, they were accused of poisoning wells with magical powders that caused the plague, with the aim of destroying the Christian community. In some countries, for instance Germany, the panic generated by this assumption led to the sealing of wells, and people were encouraged to use rivers or collect rainwater. City gates were also shut down in order to not let any foreigner in.

On the other hand, an individual could be responsible for its own illness by committing sins and transgressions. These would have a bad influence on the four humors, breaking their equilibrium that would eventually lead to discrasia and sickness. These misdeeds included excess in drinking or eating - which was actually a mode for the population to cope with plague and the quotidianity of death; oversleeping or wakefulness; sinful sex. These could all induce death of the abuser - alternatively, death would be brought about by either one of the aforementioned punishments.

b) Garments and folk medicine

Apart from God's will, a poisoned atmosphere was one of the other reasons for sickness. Some amulets would be worn or carried around in one's pockets as they were attributed the power to heal (allegedly thanks to inscriptions reported inside or outside the item). The selection of medications and talismans was closely affected by symbolism, to the point that even the colour of material would be taken into consideration as a legitimate medicament, for instance yellow materials would be prescribed for jaundice. Moreover, it was of common use carrying around the neck - like a necklace - vials that contained

spices and herbs. Priests, physicians and assistants would wear leather and waxed clothes, as it was believed that the poisoned atmosphere would not adhere to this kind of garments. For instance, the costume of the plague's doctor in Venice was a waxed cloth with a hood, a pair of glasses and a long nose - "half a foot long" - filled with "perfumes". Plus, a wand to lift the clothes of the ill person. This way, the doctor was fully isolated and the long nose could keep him at a distance from the patients (Zitelli & Palmer, 1979).

Folk medicine would follow Galen's doctrine of bloodletting and purging combined with the tradition of herbal medicine, the latter employed through the classic "trial-and-error" method, essentially empirical healing. Moreover, particular attention would be devoted to diet and routine, indeed the greatest effort employed to cope with illnesses consisted in preserving health and taking care of the person when still in fine health. Practices of surgery and midwifery had a major prominence as well.

c) Superstitions

Astrology and the legends reported by folklore played a significant role in convincing people that certain metals and precious stones possessed magical properties. Hence, carrying them around would protect its bearer from plague. Another superstition was linked to the number four, as four was the number of humors that determined health, the number of evangelists, the winds, the seasons and the elements of the macrocosm mentioned in the first chapter.

Within the field of folk superstition, it is possible to collocate popular figures who were thought to possess magical powers that cured persons. Hays (2009: 85) lists them: physicians, surgeons, apothecaries, traditional folk healers, priests, midwives, barbers, charlatans and villagers who owned the "Gift". Their popularity can be explained by the fact that physicians and surgeons, who performed their profession according to the Galenic tradition, were not affordable by everyone, being their services tendentially costly. Thus, these pseudo-medical figures emerged as they were less costly than the actual surgeons and physicians. These village healers usually attracted large masses as they also represented a more familiar figure, from the same social background who shared similar life experiences, compared to the classic Galenic physicians, who mainly

operated in the urban world rather than rural areas. Several cures seemed to work, as, in the words of Hays (2009: 86):

“[...] the sufferers believed that they would. Disease is ultimately self-defined; psychosomatic symptoms are ‘real’. At least by the seventeenth century [...] some healers knew the reality of the mind’s power over ‘disease’”.

Folklore also played a part in superstitions. During the Middle Ages the clerical culture portrayed the combat of a dragon against Saint George, bringing together elements of popular beliefs/folklore and religion. The emblem behind this fight was the struggle against the plague (“pestiferous dragon”) or alternatively the Devil, paganism or forces of nature. The victory, in any of its variants, represents the defeating of the previously mentioned enemies. The dragon is either subjugated by a Bishop or a saint, the latter does not kill it but forces it to confinement to the desert or sea, possibly symbolizing an exorcism. Peregrine Horden (Ranger & Slack, 1992: 57) talks of “pressure of an epidemic upon an idea” referring to those who wrote or spoke about dragons. In the time of Pope Gregory the Great, Gregory of Tours (538-594 AD) reports a story about a number of snakes and a dragon that swam down a river and drowned, to which followed an epidemic of plague (Patterson, 2013). In this case again the dragon (and the snakes) were the representation of an imminent epidemic. Another story reports a Welsh legend about the death of Maelgwn, the king of Gwynedd, who witnessed a “[...]‘strange creature’ with golden eyes, hair, and teeth (Smithers⁶⁷, 2018)” that would turn out to be the Yellow Plague (or Plague of Justinian) that struck between 541 and 547. Other stories report a dragon whose putrid breath turned the air poisonous (see and the conversion of the martyr Afra and the story of Bishop Donatus of 313 AD⁶⁸).

The dragon, in its numerous stories and versions, has a common thread: the embodiment of the word “disease” and “epidemic”, that can decimate the population. Peregrine Horden (Slack et al, 1992: 71) refers to it as a “beast with an ecology” as it is not a symbol but it is the epidemic itself. At times it represents the Devil itself (one shall,

⁶⁷ Although it is a source connected to a Blog, the author, Lorna Smithers, is a poet and a writer and defines herself as a “awenydd, Brythonic polytheist, and devotee of Gwyn ap Nudd”.

⁶⁸ <http://medieval.ucdavis.edu/20C/Donatus.html>

indeed, not forget the supernatural theory of disease that had strongly taken hold up until at least the germ theory) who had the power of causing illnesses and epidemics, the forces of nature that at times operate against humanhood, or paganism (which even nowadays is prejudicially matched with satanism⁶⁹).

d) Plague cults and religion

First of all, the will of the Christian God was to be considered the greatest aetiological explanation for disease. According to common mindset, God was simultaneously the cause and the only cure. This assumption produced several consequences, mostly harming the population's freedom and physical integrity.

First off, a religious cult emerged in northern Italy already in the 13th century with the aim of appeasing God and calming its wrath and spare the Christians: The Flagellants. They would cross Europe begging people to repent and publicly whipping each other, while also blaming Jews for having inflicted - by means of a conspiracy - Christendom with plague. Jews would be subjected to persecution that included arrests, harassments and physical violence. The Flagellants cults achieved the most of their success during the years of Black Plague (Tikkanen, Lotha, & Stefon, 2016).

A second cult that emerged during the decades of plague was the cult of saints, i.e. Saint Sebastian, Saint Roch and the Virgin Mary. Saint Sebastian in particular was considered to be the saint who was able to intercede on behalf of the suffering laity and was venerated and begged across all Europe for his martyrdom. A 1497 painting by Josse Lieferinxe, *Saint Sebastian Interceding for the Plague Stricken*⁷⁰, preserved in the Walters Art Museum, Baltimore, US, is one of a long series of artworks that illustrate Saint Sebastian and its link to plague. In this painting Christ is sitting on a dark cloud and is talking with Saint Sebastian, while a devil and an angel below them are arguing. The painting displays the symbols of the plague: the dark clouds represent God's wrath, Saint Sebastian kneels and begs him while the arrows - conventional emblem for plague - are

⁶⁹ See more at: <https://www.theatlantic.com/video/index/604084/pagans/>

⁷⁰ Picture available at: https://commons.wikimedia.org/wiki/File:Josse_Lieferinxe_-_Saint_Sebastian_Interceding_for_the_Plague_Stricken_-_Walters_371995.jpg

absorbed in his body, symbolizing that he took on the suffering destined to the Christians⁷¹. As a human shield, the Saint took on himself the burden of the divine anger.

Thirdly, during the plague years beliefs in “good” magic emerged, that is the worship of saint relics. Naturally, people would not refer to the relics as something that entailed a magic power, however people believed that just the closeness to those remains would cure their wounds or diseases. Pilgrims, women and men, would come from all over Europe taking expensive and sometimes risky journeys, to see and be as close as possible to them. Ill, blind, malnourished, wounded or disabled people would all turn their afflictions to the saint’s remains, light a candle and/or offer a coin (procedures with its roots in folklore) and wait for a sign, that would accordingly arrive by dream or by vision. It is possible to affirm that the position of the Church was ambiguous and controversial, bearing in mind that magic was associated with the Malign. Nonetheless, the sacraments would possess magic powers, for instance the holy water would have the ability to baptize or bless the person that was wetted by it. It is possible to find other countless references to “good magic” in the Bible itself. Following the reasoning of Hays (2009: 81), the religious ceremony means control over the course of nature. God, who would act through chosen men, would be “a supreme magician” with the ability to “part the Red Sea and bring the chariot of the sun to a halt when so requested by Joshua”. Besides, Jesus could cause “the lame to walk and the dead to rise up”.

Common people dealt with the epidemics in the only way they knew. Certainly, ignorance played the greatest part in their decisions about the right thing to do and the attitude. The society was still imprinted with a great religiousness that unfortunately led the population to commit awful actions towards people, spreading a large sense of distrust between everyone, including friends and even family members. Finding a scapegoat meant to do one’s best to have their life spared and let someone else’s be ruined, whether a friend or a relative. It was certainly a period marked by a noteworthy sense of dread: fear of the plague that took away so many lives, but also fear of everyone as anyone could turn another person into a scapegoat. Superstitions and plague cults

⁷¹ https://www.luther.edu/history/assets/The_Luther_Skald_1_1.pdf

seemed to be rather a neutral reaction to plague. However, the need to blame would arise in any case - the Flagellants would at times hold public speeches on the alleged malignity of Jews, while cult of saints was still linked to blame attribution (together with, one can assume, a need for comfort), where a Saint would intercede and beg God to spare the lives of the devoted.

2.4.2 After the germ theory

The germ theory pushed towards a gradual revolution of the conceptualization of illnesses among common people. The change in mentality was a very slow process, that was not sped up by empirical science. Despite those experiments conducted by Jenner and the other 18th century prominent scientists, fear and distrust were still largely spread. These feelings themselves encouraged movements and protests against the vaccinations made obligatory by the state and gave rise to the first leagues against mandatory vaccinations and, once again, scapegoating was resumed. Moreover, a new element was added to the list of reactions: racism.

a) No-Vax

According to some scientific researches (Belongia & Naleway: 2003), vaccination against smallpox can have some adverse effects, from mild symptoms to death (1/million vaccinations at least in the US, where these researches had been conducted). Mortality rate was also four times higher for those vaccinated for the first time compared to re-vaccinated individuals. Moreover, according to a 1968 study 529/million vaccinations can inadvertently inoculate other areas of the body by transferring the virus from the inoculation site to - usually - the eyes, mouth, nose, or genital area. The lesions generated, if serious, might require treatment. Fear of side effects led to movements that nowadays we usually call "no-vax". In the 18th and 19th century the fears had a diverse nature: popular beliefs, fear of side effects and an expression of the rejection of an increasing role of the state power.

First of all, the practice of vaccination overlapped with the religious and moral view. Considering that diseases were God's punishment of sinners, expression of his own will and wrath, inoculation in order to protect every individual from the illness coincided with an immoral and blasphemous interference with God's will itself. Secondly, again

popular convictions led by ignorance prevented people from having faith in the efficacy of the vaccine. In fact, despite the attempts of governments to compel anti-smallpox frameworks, local leaders of opinion (healers, clergymen and charlatans) enjoyed devotion on the part of common people, which constituted the largest part of the country's population (Hays, 2009: 285). The notion of contagion took hold only gradually, and many were still inclined to believe not only to miasmatic explanations, but also to more extravagant assumptions. The 19th century English caricaturist James Gillray (1756-1815) produced a piece of art that represented cow parts erupting from the body of people vaccinated at the *Smallpox and Inoculation Hospital at Saint Pancras* in London⁷². This scene aimed at proving how dangerous it was to inject animal parts behind a human being's skin, together with the fact that it was immoral and unnatural.

The third and possibly less eccentric motivation connected to no-vax ideology stems from a behaviour that we might jokingly define "contrary Mary": the more the state attempted to make inoculation prescription mandatory, the more the population, especially working class, refused to compel. Governments of Europe were aware of the vaccination's efficiency, to the point that they soon announced policies in order to proceed to smallpox eradication. Bavaria (1807), Denmark (1810) and Sweden (1816) were the first countries to introduce policies for mandatory vaccination. Italy joined the group only in 1888. An interesting case took place in Italy. The medic Luigi Sacco (1769-1836) was so interested in Jenner's experiments and findings on inoculation, he applied his methods on the cows of his own region, Lombardy. Convinced by the effectiveness of the practice, he wanted to spread the practice in this area. However, people were rather sceptical and Sacco encountered the same resistance that Jenner met in Britain, that is the fear of introducing an "animal part" in the human body and the belief that inoculation went against God's will and plan. Sacco elaborated an ingenious plan. He wrote an homily about the efficiency of smallpox vaccine that he attributed to a bishop from an imaginary city, in order to convince the population. His vaccination campaigns

⁷² Too see more about the caricature, together with other smallpox-related pieces of art: <https://magazine.jhsph.edu/2015/spring/departments/collections-the-art-of-smallpox/>

were successful and become the director of the vaccination program of the region (Garbarino, 2015).

An issue was that generally government compulsion did not translate into effective results and obedience. Hays himself (2009: 284-285) notes that modern Western states exploited biomedicine to widen their powers and “to exert a new level of control over its populations, their behaviours, and the ailments that beset them.” Moreover, states themselves recognized that the prosperity of the nation went hand in hand with population size and military power. The author argues thus that the concerns expressed for the overall health was not linked to a sentiment of benevolence, but rather to an effort to expand the state’s power. Through the imposition of vaccination obligation European people seemed to perceive this feeling - of a government that tried to take control of their own private sphere. This feeling gave rise to anti-vaccination movements, in particular in England after the promulgation of the *Compulsory Vaccination Act* in 1853, making the practice mandatory. People felt that their personal liberties would be damaged by such an incursion into their private life. Weber (2010) proposes the following reasoning:

“The Victorian vaccination legislation was part of an unfair, thoroughly class-based, coercive, and disciplinary healthcare and justice system: poor, working-class persons were subjected to the full force of the law while better-off persons were provided with safer vaccines and could easily avoid punishment if they did not comply.”

Essentially, the opposition against the compulsion as expression of state power was rooted in a feeling of discrimination and the fear to lose personal freedom. Working class was subject to stronger obligations and had to endure punishment in case they refused to comply, moreover the qualities of the virus samples and the skills of the medical personnel were unpredictable and untrustworthy. On the contrary, the wealthiest part of the society had access to better medical care and to a more favourable treatment.

From the 18th century, medicine has achieved important progress including making vaccines safer. In spite of the fact that it might raise some concerns when the patient involved has serious health conditions (e.g. immunocompromised), smallpox

inoculation has overall proved to be effective, as demonstrated by the successful world-scale eradication put in place at the end of the 20th century discussed in chapter 2.3.1. Unfortunately, smallpox vaccination raised anxiety for a very long time as 18th and 19th people's mindset was still linked to ancient disease theories. The supernatural theory of diseases still insisted and affected the mentality of modern persons, as well as miasma theory that instilled doubts on the effectiveness of infecting an individual's body with a virus in order to not develop a serious illness. Concerns, doubts and feelings of oppression produced the first movements that opposed a compulsory policy of vaccination, interpretable as a "cry for help" for better medication, treatment and - perhaps - a campaign of awareness and information.

b) Scapegoating

In spite of the scientific and economic progress achieved by the 19th century, one disease acted as a watershed in society: cholera, which represented a break into the optimism of Western society. Its nature and diffusion contributed to disunifying 19th century society. Generally, people reacted in three different ways: with shock, anger and fear.

First of all, Ranger & Slack (1992: 154 et seq) note how cholera was a shock for the sensitivity of the society. Its symptoms, which included diarrhoea and vomit, were grossly different from the illnesses that led to a dignified, almost romantic death, e.g. the course of tuberculosis infection - which took away an individual's life gradually, making his/her death a sort of beatification for the people assisting at his/her bedside. On the opposite, cholera represented the regression not only of the individual but also of the society itself, that by that time was achieving so much progress in all fields. The symptoms occurred provoked an intense affliction that killed rapidly and with horrible demeaning symptoms. At that time Europe was asserting its hegemony, a self-confident region that possibly felt superior to the other civilisations of the New World and the East. Cholera was a crack in this perfect, utopic model of Western society. It came from an "underdeveloped" civilization from outside the Old World, it arrived and had a fast time course - sometimes a time span as short as 12 hours - degrading the person's dignity and shocking those nearby.

Secondly, cholera represented the crack in the utopic perfection of modern European states and towns. Not only did this ailment arrive from the “uncivilized”, but also affected more the poor than the rich. This fact gave rise to two curious, opposite reactions: the poor would argue that the rich were poisoning them, whereas the rich would blame the poor for having attracted this affliction on themselves and their own families, because of their uncivilized nature and way of living. In practice, occupations that involved touching water were the most affected ones, i.e. sailors, fishermen, domestic servants, inn-managing. Therefore, in a way contagion was at least partially determined by the social position occupied by the individual. Wealthier people were usually never occupied with tasks that involved water, having servants and facilities that allowed them to maintain certain standards of hygiene. This contrast led to social tensions, as people thought of the middle class as cholera spreaders - just like it happened with *untori* during the plague epidemic in 1630 in Milan. People’s conjectures brought about violent riots and destruction of properties in big cities from Russia to Britain in the 1830s. Riots, wars and large density of population facilitated the spread of cholera.

This leads to the third point: cholera generated fear among the general climate of popular unrest. Just like it happened many centuries earlier with plague, when Jews and “witches” were blamed, 19th century society eventually put the blame on specific groups of people: this time, apart from the rich, also authorities and medical practitioners. In the last centuries the role of the state and its intrusion had grown to the point of introducing invasive measures against epidemics: sanitary cordons, quarantine, fumigation, isolation, disinfection, all under a close surveillance of the state’s authorities. These policies were resumed at the time of cholera, but the population was still under the influence of the past French Revolution and decay of Absolutism, therefore folk was not willing to let this new, more democratic climate be tarnished. Popular unrest ended up being directed at the actions against cholera more than cholera itself (Ranger & Slack, 1992: 154 et seq). On the other hand, the resentment was also directed at medics, as they were the ones in charge with deploying the measures indicated by the governments. Among the implemented measures, the one that forbade mourning and burial concerned the population very closely, as it affected

their popular custom and prevented them from bidding farewell to their beloved ones. In Britain, particular anger was addressed to doctors, who in 1832 were attacked by the crowd, as it was thought that they were intentionally killing poor people to provide corpses for the medical school of the University of Edinburgh (Cregan 2008).

In Italy, the U.K., France and Spain the rumors about alleged poisoning operated by the middle class turned into a clear manifestation of hatred towards the bourgeoisie, the government and their “conspiracy tools”, i.e. the doctors. This loathing was manifested through protests against pharmacists and hospitals and the refusal by the poor to be hospitalized. In fact, since the invention of lazarettos in the middle ages, hospitals were the symbol of emargination and disgrace, as they were created specifically for the indigent, moreover they had the reputation of neglecting the sick. The protests turned also into physical violence. For instance, in Genova the numerous episodes of intolerance lead the Marquise Filippo Paolucci to intimidate the population by comparing the attackers of “cholera-spreaders” and those who spread false rumors to convicted murders. In Madrid, fear grew to the point that people suspected that some cloisters were keeping poison; The friars were lynched. These episodes of violence involved the bourgeoisie and the doctors, but in some cases they also took on the form of personal vengeance and family feuds. As a matter of fact, the accusations of being an *untore* constituted an efficient way to get rid of enemies.

In order to avoid social tensions, most European countries decided to adopt relaxed measures: no impositions, no forced removal of victims from their houses, recommendations instead of orders. The governments also took the decision to stop publishing notices about cholera cases, judging the release of this information alarmist. Countries where maritime trade was a pillar for the economy tendentially had their government withdraw almost completely from the struggle against cholera. The epidemic which followed at the end of the 1840s aroused less population discontent, thanks to less strict controls and also because the opinion on medics improved (Preto, 1987).

c) Racism and discrimination

When it comes to syphilis, a bracket on immorality is automatically opened. In the past, there was not an immediate distinction between venereal and non-venereal cases, and its mysterious character led Europeans to the weirdest conclusions and charges. We will see how syphilis contributed to the spread of European racism in Africa, taking Uganda as an example, instilling justifications to racism that have dragged themselves and evolved to the present day. This aspect overlaps with scapegoating, however because of its nature and the mentality involved one should look beyond this aspect. Ranger & Slack (1992: 269 et seq) refer to the influence on the African society only in terms of missions to “remove the evil” and modernize the region, however we will take a step further and see these incursions in a different light, and explain how and why it can be linked to an element of racism.

In 1799 the Church Mission Society (CMS) was established, preceded by the London Missionary Society (1795), with headquarters in Oxford. It is a mission society of Anglicans and Christians that, during the 19th century aimed most likely at the conversion of “sinful” populations. The Rev. Dr. Peter Cruchley, secretary for Mission Development at the Council for World Mission, in a 2020 article describes the founding society by using accurate expressions. It is important to see how missionary organizations of the contemporary age consider their deeds of the past. Cruchley wrote the article *Silent No Longer - The Roots of Racism in Mission* which aims at the investigation of the historical racism roots found in the original Missionary Society(s). He points out two important aspects: seek for approval and manipulation, although disguised in a mission of charity.

“[...] a product of English (middle) class sensitivity, in which it anxiously seeks the approval of the establishment while asserting its own lifestyles and vision as the heart of the new world. [...] a lesson in the manipulation of all classes by the new bourgeoisie.⁷³”

⁷³ <https://onlinelibrary.wiley.com/doi/epdf/10.1111/erev.12490>

Slavery was largely exercised. The Rev. Cruchley states that the missionaries derived from the working class and lower middle class, and the impact of their social condition stands out when attention is focused on slave ownership. Moreover, schools were founded, where White supremacy was taught in terms of teaching the children to be obedient and active in their work.

Moving to a specific case, Albert Cook (1870-1951) was a British medical missionary⁷⁴ involved in missions in Uganda⁷⁵. He, together with his colleagues, stressed that sin and disease were strictly connected. The values of the African society relied on different standards, that according to the “more evolved” Western society were to be considered evil: polygamy and paganism, which clash with the strict monogamy and monotheism of the Christian society. It was therefore clear to European missionaries that the syphilis epidemic could not be avoided and was, perhaps, well-deserved in a society such as the African one. Naturally, the only remedy to remove the retrogradation and the malignant was the conversion of Christian values and Western habits. Essentially, the only possible solution to syphilis - and for the medical cures to work - consisted in the Westernization of the African society. The means employed to control syphilis in Africa was essentially one: the extension and strengthening of Christian power. The incursions at the hands of European medics and missionaries shattered the native societies, which had less and less power of control. Europeans strengthened their own hegemony in order to “fix” them. Christian morality was enforced, and missionaries tried to impose premarital chastity and monogamy - essentially, a radical change that affected the roots of the traditional society.

It is evident how Europeans, by the pretext of sin and purification, took for granted that a society different from the Western one had to be changed, as it was

⁷⁴ We are not going to analyze his medical career in Uganda in depth. It was a successful one, nonetheless we will rather employ him as an example to explain why the CMS performed his mission - the insight provided in this chapter is specified in the previous paragraph. However, in 1970 the British Medical Journal published a complete article that illustrates Cook's medical deeds in Uganda, which is available at: <https://www.bmj.com/content/bmj/4/5737/738.full.pdf>

⁷⁵ Photographic evidence of the years 1897-1940 have been published online by *History in Progress Uganda*, a blog that gathers and publishes photographs about Uganda from various collections and archives. They are available at: <http://www.hipuganda.org/collection/uganda-memories-1897-1940-by-albert-cook>

backward and could simply not exist without the intervention and solutions of the modern European society. The value of individuality was not contemplated: their hierarchy and society in its entirety had to be changed from the very bottom, the roots had to be ripped off in order to wipe out the evil and sins. This approach to the “different” had already been applied earlier, during the years of the Great Discoveries, and acts as a second confirmation of how much an advanced society is in reality afraid of difference and incapable to accept a different thought and ways to live life overall.

CHAPTER 3

CONTEMPORARY WORLD: CORONAVIRUS-19 (THE FIRST WAVE)

In our contemporary world, science, technology and society are progressing faster than ever. In Europe modern hospitals, infrastructures and healthcare ensure that each individual is properly taken care of. Thanks to the introduction of the germ theory in the 19th century, humanity has understood that certain diseases are contagious and that they are spread in different ways, for instance airborne droplets (seen in the case of smallpox) or water infection (vector of cholera bacterium). Along the course of two centuries the theories and new scientific discoveries have been gradually accepted and internalized by the population and governments in their whole, therefore the application of measures to contrast epidemics has been easier. After all, like the journalist Applebaum (2020) comments: “At times when people fear death, they go along with measures that they believe, rightly or wrongly, will save them - even if that means a loss of freedom”.

Experts have learned about the concept of contamination and contagion and learned that avoiding it corresponds to stopping outbreaks of illnesses, epidemics and pandemics. The power of the state has increased and invaded the private and public sphere, in order to avoid unmanageable situations such as the ones we have seen in the previous chapter. On the whole, one expects that the measures to contrast epidemics and the attitude of the population in general moved forward hand in hand with progress. Nonetheless, as we will see in this chapter, for some aspects modernization has worsened the consideration of illnesses and of governments and was actually employed to deepen certain beliefs, turning them into well-established conspiracy theories. Other times, modernization reasserted the affirmation of “coping mechanisms” emerged in the past, like scapegoating and racism.

The general decrease in mortality rate has inevitably led to an increase in population density and it apparently confirmed, at a distance of circa three centuries,

Malthus theory: when the population reaches its peak, a constraint force brings the number back to a manageable level: COVID-19 pandemic has taken away, to the present day (Feb. 7th, 2021), 1.605.091 lives and the confirmed cases are 104.956.439⁷⁶. This chapter explores the impact of possibly the most outstanding epidemic of the last years comparing it to the past. We will also try to understand the impact it had on the population so see whether people's reactions changed, evolved or stayed the same. The aim is to analyze the government responses and the reaction of the population. The first and immediate answer that one might come up with is that, considering the progress achieved to the present day in practically every field known to humanity, the handling of the 21st century pandemic was better structured and organized than what we have observed in the past. However, one should remark Snowden (2019)'s words quoted in paragraph 2.2.4: everywhere, epidemics have always caught authorities unprepared. A more suitable question, then, would be: to what extent has COVID-19 caught authorities unprepared/prepared?

To the present day (beginning of 2021) there have been two COVID-19 waves. In this chapter we will analyze mostly the first wave, as the data, the facts and the developments of the second wave are still ongoing and it might be risky to state a long-term fact, as it might be disproven within days. The first wave already began, performed and exhausted its course and what has been done or stated cannot be changed or refuted. Consequently, many sources analyzed will date back to the first wave, therefore to February, March and April 2020. I will employ them considering every development that took place and possibly solved the case or the situation discussed in the papers. Hence, we will observe and comment data and conclusions with this mindset. In this sense, in terms of knowledge of the successive developments, we are a step ahead of some of the scholars we will consider.

Chapter 3.1 is the general overview of COVID-19: what it is, what it causes, how it spread, where it came from. It groups up the most important measures taken on the European level, including the protection of civil population, funds allocation within the European region and the education of the general population to which contributed the

⁷⁶ <https://covid19.who.int/>

limitation of certain contents on social networks and the updating of these platforms' settings. Chapter 3.2.2 focuses on the Italian case, namely the way in which Italy coped with the pandemic. We will talk about the changes introduced by the fourteen Decrees emanated during the first Covid wave and then move to three central points: the internet portals used for health communication, the measures taken to prevent and contain the virus (i.e. physical distancing, isolation, quarantine), the implementation of new infrastructures and workforce. Lastly, in chapter 3.3.3 we will investigate the reactions of the population to COVID-19 pandemic, that were expressed through the refusal either of the measures or of the virus existence itself (e.g. no-mask and no vax-movements), the manipulation of information to create conspiracy theories and lastly victim blaming and racism.

We will observe how in the 21st century prejudices and conspiracy theories gave rise to an out-and-out international phenomena that condensed into this phenomenon called "fake news". Fake news was already circulating when commercial networks began to intensify. Its purpose was to essentially undermine the competitors. It will be interesting, however, to observe how it evolved and how it is interpreted nowadays, as it is applicable to almost every field. If we consider the milestones, fake news had a particular prominent role after the Early Modern Period, in 2017, during the American elections (Riva, 2018). In such a way, it is possible to claim that nowadays fake news is the common thread for people's reactions that we will see in chapter 3.3.

3.1 Origin of the COVID-19

Coronavirus-19, also called COVID-19, SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) or 2019-nCoV (Novel Coronavirus) is an infectious acute respiratory disease caused by a new coronavirus, Sars-CoV-2, discovered in 2019. On February 11th, 2020 the name officially became COVID-19, which stands for: Co (corona); Vi (virus); D

(disease); 19 (its identification year)⁷⁷. The WHO declared COVID-19 a Public Health Emergency of International Concern on January 30th 2020, whereas it was declared a “global pandemic” on March 11th, 2020.

COVID-19 affects in different ways. It usually takes five to six days for the first symptoms to appear but sometimes it might take up to two weeks. Most people develop a mild to moderate illness and usually recover without hospital intervention. It is transmitted person to person by means of airborne droplets and by direct or indirect contact with eyes, mouth or nose. The most common symptoms, listed by WHO, are fever, dry cough, tiredness. Less common symptoms include aches and pains, a sore throat, diarrhoea, conjunctivitis, headache and the loss of taste or smell. Serious symptoms include difficulty breathing or shortness of breath, chest pain or pressure and loss of speech or movement⁷⁸. The spread primarily involves situations of close contacts, and contagion occurs at 6 feet / 1.8 meters distance. (Casella et al., 2020). The treatment can vary based on the gravity of the infection. Regardless, both suspect and confirmed cases must be isolated. Generally, the patient is required to rest in bed and enjoy supportive treatments to ensure sufficient energy intake. However, the more critical cases might require hospital treatment in an intensive care unit, possibly grouping the patients in the same ward (Li et al., 2020).

The first cases reported were identified in Wuhan, located in Hubei province, China, as the first unexplainable low respiratory infection reported to the Chinese WHO office dates back to December 31st 2019. China discovered that the virus was a zoonotic pathogen that possibly originates from the bat *Rhinolophus affinis* (Casella et al., 2020). The source of the infection was traced back to a seafood and wet market in China, *Huanan Seafood Market*, shut down on January 1st, 2020. A definition of wet markets is provided by Wilson & Chen (2020):

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http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministero&id=4067

⁷⁸ https://www.who.int/health-topics/coronavirus#tab=tab_3

“[...]large live animal markets selling multiple species of wild and domestic animals in proximity to large populations of densely housed humans who are extensively connected by air, land and water to the rest of the world.”

This quote sums up the characteristics and the problems generated by said public events. Live animals (together with carcasses and meat) sold in a market which is located in a strategic position, that is in proximity to densely-populated centers, boast (as seen in the previous chapters) the most favourable conditions for the spread of illnesses. Moreover, Wuhan is a city with 11 million inhabitants and is well connected in terms of means of transportation. This set created the best conditions for the transformation of a small epidemic into a pandemic. Wilson & Chen (2020) also underline another cause. Human intervention and modification of the environment have caused animals to move physically closer to human-populated centers, favouring the interaction animal-man hence the exchange of disease. Events such as deforestation, land clearing for cropping and building of dams have increased in recent decades. These changes have destroyed animal habitats, displacing them and leading to a more intense contact between animal kingdom and humans. These are the modifications brought about by modernization that, as we have seen in chapter 2, involved human intervention and manipulation of the environment. In this case, the environment was damaged to the point that animals were pushed closer to populated areas.

3.2 Arrival in Europe

There are no precise dates that indicate the beginning and the end of the first COVID-19 wave in Europe. For this reason, we will specify herein which, for the sake of this thesis, will be considered the date of the beginning and of the end of the first outbreak. As for the start, we can consider 24th of January 2020⁷⁹, that is when the first confirmed case was registered in France. The ending date can be based on the COM(2020) 399, 11 June 2020 - *Communication from the Commission to the European Parliament, the European*

⁷⁹ Our estimate of Covid outbreak in Europe is independent from the actual date in which WHO declared COVID-19 a “public health emergency of international concern” and/or “global pandemic”.

Council and the Council: On the third assessment of the application of the temporary restriction on non-essential travel to the EU. This document reported a strong encouragement by the European Commission for “[...]the remaining Member States to finalise the process of lifting the internal border controls and restrictions to free movement within the EU by 15 June 2020”⁸⁰. Therefore, the date we will consider concerning the conclusion of the first COVID-19 wave will be June 15th, 2020.

The first case reported was detected in France on January 24th 2020, whereas the first death was reported on February 15th in the same country. Within a month circa after the first case was registered - February 21st - , nine European countries reported a total of thirty-eight cases. More than half of the patients were infected in Europe. Within the same date the virus had spread also to twenty other countries and it is also during these days that in Italy the first two alarming outbreaks erupted.

3.2.1 Measures on the European level

In this chapter we are going to investigate the response of Europe and its partners to the novel coronavirus emergency. Being aimed at the EU, the international organizations considered will mostly be the ones managed by Europe thus limited to European countries, whereas global organizations that comprise extra-EU countries will have a secondary place. WHO’s role will be examined in relation to the facilitation of European operations. The aim of this chapter is to observe, after two centuries from the first international agreements stipulated at the time of a health emergency, a truly effective demonstration of how an international agency can conduct operations to handle a health crisis involving a new illness. The key words are collaboration and coordination.

I will group together and analyze what I consider the four main actions put into place by the European Union during the first wave of COVID-19 that demonstrates the efficiency and great coordination of the European Union. The first operation we are going to see is the ICPR, namely the integrated political crisis response mechanism, in particular its action in relation to the protection of the civil population. We will devote

⁸⁰ The full document is available at: https://ec.europa.eu/info/sites/info/files/communication-assessment-temporary-restriction-non-essential-travel_en.pdf

it room as it is the first operation that European Union implemented, that led to repatriation of several thousands of European citizens and to the creation of a common fund “rescEU”. The second important action actuated by Europe was the provision of funds, large budgets, to cope with the crisis. The last action we will see involves the internet, namely Facebook and YouTube, monumental platforms of communication that can influence the population, who engaged themselves into the education and provision of data in relation to COVID-19 as well as the removal of harmful contents for the sake of correct information and to safeguard individuals’ integrity.

Protection of civil population and *RescEU*

Already before the novel coronavirus was officially declared an international emergency, on January 28th, 2020 Europe engaged itself in the first actions to contrast a likely emergency outbreak. It did so by activating the EU’s integrated political crisis response mechanism (IPCR) thanks to the decision of the Croatian Presidency. The IPCR is the “EU framework for coordination of cross-sectoral crises at the highest political level”. It is activated when either an artificial or a natural crisis/emergency occurs. The need for such a mechanism emerged in the 2000s in response to dramatic events that included the 9/11 Twin Towers attack, the bombings in Madrid and London in 2004 and 2005 and the 2004 tsunami of the Indian Ocean⁸¹. It can be activated either by the presidency or by a member state (all 28 European states are participants) that invokes the solidarity clause. Subsequently, the presidency collects the actors - EU institutions, affected member states and other eventual key stakeholders. The key word of IPCR is collaboration, as it aims at information sharing, working together and coordination into an effective response to the crisis. Three operational modes are available: monitoring (sharing of information), information sharing (involves the creation of reports and preparation for a possible escalation of the crisis) and a full activation (that can lead to creation of proposals upon which the Council or European Council deliberate)⁸². The arrangements were initially activated in information sharing mode; however it was

⁸¹ <https://www.consilium.europa.eu/en/policies/ipcr-response-to-crises/>

⁸² <https://www.consilium.europa.eu/en/infographics/ipcr-mechanism/>

switched to full activation on March 2nd 2020 as the sectors involved in the COVID-19 emergency were several.

The integrated political crisis response (IPCR) instruments include a mechanism for the protection of the civil population, which goal is:

“[...]to strengthen cooperation between the EU Member States and 6 Participating States [...], improve prevention, preparedness and response to disasters. When the scale of an emergency overwhelms the response capabilities of a country, it can request assistance via the Mechanism. Through the Mechanism, the European Commission [...] contributes to at least 75% of the transport and/or operational costs of deployments⁸³”.

It works in the direction of both prevention and aid delivery (which comprises operations of rescuing and searching, firefighting, deployment of medical personnel, purification of water, temporary shelter in case of emergency, safe repatriation, development and search). Civil protection has been deployed circa 420 times since 2001. From 2019 it has been activated further to the tropical cyclone Idai in Mozambique, the earthquake in Albania, the fires in the forest of Bolivia and Greece and, lastly, in the aftermath of COVID-19 health emergency in 2020⁸⁴. On June 18th 2020 - approximately at the end of the first wave - the Council of the European Union published the *Report from the Croatian Presidency on the main achievements at EU level in the field of civil protection*⁸⁵.

According to the report, a great achievement was reached in the repatriation of 75.000 EU citizens from 19 European countries from third countries that closed their borders and suspended transport circulation. On February 1st and 2nd, the operation began and 447 European citizens returned to their countries from Wuhan. By March 27th almost 10.000 people had been repatriated⁸⁶. On March 19th the Commission

⁸³ https://ec.europa.eu/echo/what/civil-protection/mechanism_en

⁸⁴ <https://www.consilium.europa.eu/en/policies/civil-protection/>

⁸⁵ The document is available at: <https://www.consilium.europa.eu/media/45688/st08933-en20.pdf>

⁸⁶ European repatriated citizens shared their stories on Twitter with the hashtag #WeTakeYouHome. Their stories have also been shared in [eas.europa.eu](https://www.eas.europa.eu) and are available at:

instituted the very first RescEU stockpile⁸⁷ of medical equipment to help EU countries to deal with the COVID-19 emergency. It included vaccines, therapeutics, intensive care equipment (e.g. ventilators) and protective equipment for the individual (e.g. masks), laboratory supplies as well as trained professionals. The report refers that 370.000 masks from the stockpile held by Romania and Germany were distributed among Italy, Spain, Croatia, Lithuania, Montenegro and North Macedonia. Moreover, Germany restored their stockpile with 363.500 FFP2 masks two months later. The goal of RescEU stockpile is to have an emergency reserve from which European countries can draw, upon requests through the Mechanism, according to their necessities. A budget of 380 million euros was made available and six countries (Denmark, Germany, Greece, Hungary, Romania and Sweden) hosted the RescEU stockpiles⁸⁸.

Moving into the specifics, Civil Protection Mechanism implemented several actions to assist European countries in particular Italy, starting from April 7th, as it was one of the countries that boasted the most critical situation. On this date, medical personnel from Romania and Norway were deployed to Italy in the cities of Milan and Bergamo. Austria contributed to the aid offered to Italy through the Mechanism by devolving 3.000 liters of disinfectant. All these operations were coordinated and co-financed by the Commission. Pride was expressed by the President of the European Commission for the solidarity demonstrated by nurses and doctors. Moreover, *Copernicus*⁸⁹ was engaged in order to map public areas and health structures during the COVID-19 crisis⁹⁰. Fourteen days later assistance via the Mechanism was invoked again

https://eeas.europa.eu/headquarters/headquarters-homepage/76203/good-stories-consular-support-eu-citizens-stranded-abroad_en

⁸⁷ RescEU is a plan that aims at the reinforcement of the European civil protection mechanisms to deal with natural catastrophes. Specifically, to enhance the mechanism in March 2019 a stockpile was created. It includes, for instance, helicopters and airplanes. (https://ec.europa.eu/italy/news/20190321_UE_in_vigore_meccanismo_protezione_civile_europeo_it)

⁸⁸ https://ec.europa.eu/echo/field-blogs/photos/strongertogether-eu-s-civil-protection-response-coronavirus_en

⁸⁹ “Copernicus” is the satellite system of the European Commission that aims at the development of “European information services based on satellite Earth Observation and *in situ* (non space) data” (source: <https://emergency.copernicus.eu/mapping/ems/what-copernicus>)

⁹⁰ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_613

by Italy (and also Croatia and neighbouring countries) and disinfectant and masks were sent to Italy from Slovakia⁹¹.

Funds allocation (within Europe)

A large amount of funds was implemented to assist Europe and its member states since the beginning of the coronavirus crisis. This section will investigate in specific the efforts undertaken by the European Commission in the field of scientific research and healthcare and aid to small and medium businesses.

Two days after the EU civil protection mechanism was activated and one week after the first case was registered in France, on January 31st the first funds for the research on the novel coronavirus outbreak were mobilized - 10 million euros, increased to up to 48.5 million - by the European Commission for its research project called *Horizon 2020* (hashtag: #H2020), launching an emergency call. Horizon 2020 is a financial instrument, and:

“[...]the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract.⁹²”

Everyone could apply to the call. The aim was to deepen the knowledge on the new coronavirus and improve the clinical management of the infected individuals. On March 6th, seventeen projects were selected while on the 30th the Commission selected and added the eighteenth proposal⁹³. They concerned four areas: promptness and

⁹¹ For a matter of space it is not possible to list all the operations of aid and solidarity accomplished within Europe. The complete and detailed actions of solidarity among European member countries and from Europe to EU countries are described at the following page: https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/coronavirus-european-solidarity-action_en . On the other hand, state aid cases and details of each measure taken in every EU country are available at: https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/jobs-and-economy-during-coronavirus-pandemic/state-aid-cases_en

⁹² <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

⁹³ The full list of projects titles, description, coordinators and partners are available at: https://ec.europa.eu/info/sites/info/files/research_and_innovation/research_by_area/documents/ec_rtd_cv-projects.pdf

response, diagnostics, treatment and vaccines⁹⁴. Two months later, on May 4th 2020, the President of the European Commission Ursula von der Leyen launched the Coronavirus Global Response initiative in response to a WHO's call to develop research and technologies for COVID-19 (following the G20 summit of March 26th⁹⁵). On May 12th, after its launch in March by the public-private partnership of IMI (Innovative Medicines Initiatives), the Commission announced 8 large-scale research projects aimed at the development of treatments (three projects) and diagnostics (five projects) for the novel coronavirus. They involved 94 organizations, including universities, companies and public and research organisations. Small-middle enterprises (SMEs) constituted around 20% of the participants and received 17% of the budget⁹⁶. To facilitate the collection and sharing of data about the novel coronavirus, the European Commission (together with other partners) launched the online platform <https://www.covid19dataportal.org/> . Horizon 2020 started to develop positive results already in May, when the “HG nCoV19 test” project provided a molecular diagnostic test that could detect viral infection within 30 minutes⁹⁷.

On the other hand, to support the healthcare sector, the Council approved the Commission's proposal of mobilization of 2.7 billion of euros from the EU budget to activate the Emergency Support Instrument (ESI). It was summed to the rescEU stockpile, which already had an available budget of €380 million. First of all, by means of an internal Task Force, the ESI charged itself with funding essential medical supplies starting from masks and respirators. Then it coordinated the cross-border region transportation of patients as well as medical gears and tools, and the recruitment of extra healthcare personnel to be sent in the most needed areas around the European Union. Finally, the ESI used part of this budget to build mobile field hospitals. Second of all, the budget is employed in medium-long term goals to contribute to the mass tests

⁹⁴ https://ec.europa.eu/info/news/emergency-coronavirus-research-commission-selects-18th-project-develop-rapid-diagnostics-2020-mar-31_en

⁹⁵ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_797

⁹⁶ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_837

⁹⁷ See more at: https://ec.europa.eu/commission/presscorner/detail/en/mex_20_917 and <https://cordis.europa.eu/project/id/101003713>

effort of member states, as well as assistance in medical research of the single countries. This deployment of efforts aims at the coordination of the EU response to the COVID-19 emergency, accompanying European countries to the recovery and, finally, the exit from the crisis⁹⁸. On April 22nd the Council decided for more flexibility on the disposal of EU funds for a quicker and more effective coping with the consequences of COVID-19 in the areas of economy and society. The decision led to temporary suspension of some rules that define “[...]the scope and priorities of national programmes that can be financed by the various funds [...]and] the conditions under which regions are entitled to receive support.” Moreover, the resolution guarantees “exceptional flexibility to transfer money between funds and between regions”⁹⁹.

Another action concerns the mobilization of European resources to rescue small-middle enterprises. On April 6th €8 billion from the European Fund for Strategic Investments (EFSI) under the COSME Loan Facility and the InnovFin SME Guarantee (under Horizon 2020) was unlocked by the European Commission to provide liquidity to around 100.000 SMEs who suffered great losses because of the Covid emergency. It fulfils the Communication made by the Commission in March, that promised to take action for an immediate relief to small and medium-sized companies. Financial intermediaries - including banks and other lenders - were offered guarantees by means of a “call for expression of interest” via the EIF. The guarantees mostly include an easier and quicker access to the EIF and a high risk cover (a maximum of 80% instead of the usual 50%). Another key feature is the access to more flexible terms, that could comprise a postponing, rescheduling, or payment holidays¹⁰⁰. Successively, on April 28th a banking package was adopted by the Commission in order to facilitate loans to businesses (and households) in the European Union. The package aimed at making banks more resilient, optimizing their ability to absorb loss and lend money. Thanks to some “quick fix” amendments to banking rules, banks’ flexibility hand in hand with responsibility were increased in terms of support of citizens and SMEs. Lastly, the

⁹⁸ https://ec.europa.eu/commission/presscorner/detail/en/mex_20_657

⁹⁹ <https://www.consilium.europa.eu/en/press/press-releases/2020/04/22/covid-19-more-flexibility-for-deploying-eu-budget-money/>

¹⁰⁰ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_569

banking package includes a “Commission Interpretative Communication on the application of the accounting and prudential frameworks to facilitate EU bank lending”, that welcomes flexibility in EU rules concerning “public and private moratoria on loan repayments” and highlights the possibility of banks to support businesses and citizens by means of digital services (e.g. contactless and digital payments)¹⁰¹.

On May 15th the Council the EU ambassadors reached a temporary agreement called SURE, *Support to mitigate Unemployment Risks in an Emergency* (activated four days later). It aimed at supporting workers into keeping their job during this time of crisis, granting loans to European Member countries to employ in public expenditures¹⁰². A week later, the Commission presented the project for a Recovery Fund, also called Next Generation EU¹⁰³. Finally, on June 8th seventy-two innovative companies were granted a total amount of €314 million, part of the *Horizon 2020*. Half of those businesses worked on ground-breaking projects that included e.g. the expansion in the production of bio-decontamination wipes and a monitoring system on the ventilation quality. The other half was concerned with multisectoral projects, that included for instance the improvement of wind turbine towers derived from wood modules that can notably reduce the costs of wind energy¹⁰⁴.

Education and limitation of harmful content on the internet

Coping with the novel coronavirus pushed the EU and its member states not only to take measures to protect themselves, prevent and fight COVID-19, but also triggered a process of education of the general public on the pandemic that overtook the countries. The education and spread of information is a monumental revolution in comparison to the past, as the population did not enjoy any particular process of education about the outbreaks they were living. A notable step was achieved in this sense, as international

¹⁰¹ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_740

¹⁰² https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/financial-assistance-eu/funding-mechanisms-and-facilities/sure_en

¹⁰³ Not particularly relevant during the first wave, as it is a recovery plan for the period 2021-2027. To read more about it: <https://www.agendadigitale.eu/documenti/recovery-fund-che-cose-e-a-cosa-serve/>

¹⁰⁴ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1007

organizations, network of information and internet permits everyone to access data and updated information in relation to the disease, in this instance COVID-19.

We are going to see what social networks did to spread correct information about the coronavirus¹⁰⁵. Being well aware of the importance of the internet in our daily life and the speed at which the internet can spread any kind of information, it is safe to affirm that the mobilization against Covid and the campaigns to sustain a correct information took place mostly on the internet. This method is highlighted by the fact that after the beginning of the pandemic, several countries (as we will see in 3.2.2) initiated a quarantine to contain the diffusion of the virus. During this time, leaving home was forbidden, many trading activities were closed, and the only way to connect with friends and family and gather information about the virus and what to do was the internet. This is the reason why we are going to analyze the contribution of two of the biggest social networks. Firstly Facebook, which dealt with the limitation of misinformation and harmful content distribution, and the connection of people to data and information about the virus. Secondly YouTube, which strictly monitors the contents uploads and the creators, and adapted its policies to the current emergency. We will see the role they played in the diffusion of news about COVID-19. These measures are still active to this day (January 2021) and were not interrupted at the end of the first wave, and are constantly updated following the evolution of the virus and of scientific research (e.g. the vaccine that is being distributed nowadays).

Facebook is the biggest social network on the internet, counting 2.23 billion of users¹⁰⁶. At the beginning of the health crisis in January 2020 - specifically on the 30th, when the WHO declared COVID-19 a public health emergency of international concern - Facebook started to put into place actions to collaborate with WHO. Their commitment is mainly concerned with two actions: limiting the diffusion of both misinformation and harmful content in relation to the virus and connecting people to useful data and information. Firstly, Facebook collaborates with third-parties whose role is fact-

¹⁰⁵ In this instance, it is important to point out that “fake news” are constantly spread around the internet, however I chose to develop this particular topic in 3.3.

¹⁰⁶ <https://buffer.com/library/social-media-sites/>

checking, namely reviewing contents and disproving fake claims. Certain false claims and also conspiracy theories are banned in order to safeguard whoever comes across them. This kind of harmful contents includes sharing posts and publishing allegations aimed at the discouragement of treatments and/or that may push towards inappropriate precautions, e.g. drinking bleach to kill the virus (Pilkington, 2020). Another harmful content from which Facebook wants to protect people are advertisements that aim at the exploitation of COVID-19 emergency for their own financial gains, for instance certain advertisements about face masks that promote the product using false claims (Lyons, 2020). Secondly, Facebook works hand in hand with health organizations to provide information and support to its users. To achieve this, Facebook endeavours to give priority to reliable sources. For instance, when someone clicks on a hashtag on Instagram - this social network was acquired by Facebook in 2012 - a pop-up with trustworthy information appears. Moreover, considering that advertising takes up a notable space on these social networks, Facebook allows organizations to develop coronavirus education campaigns for free in affected areas. In addition, Facebook supplies partners with data tools, e.g. high resolution population density maps, to help improve forecast models and, finally, created a Business Resource Hub - <https://www.facebook.com/business/resource> - to support companies and their customers during Covid time. Lastly, Facebook activated itself in the area of funds and investments to cope with the emergency, e.g. the collaboration of March 2020 with the United Nations Foundation and the WHO to create a Solidarity Response Fund, to which everyone could donate (Jin, 2020).

On the other hand, YouTube is the second most popular platform with 1.9 billion users, placing itself ahead of the world's most famous messaging platform Whatsapp¹⁰⁷. On March 20th, the official channel of YouTube, *YouTube Creators*, uploaded a video on the platform¹⁰⁸ to answer the question of content creators concerning what was going to change and how to behave. YouTube takes responsibility for the cancelling of harmful content that contradicts the provisions of the WHO and that report conspiracy theories.

¹⁰⁷ See note nr. 36

¹⁰⁸ Available at: https://www.youtube.com/watch?v=i352PxWf_3M

Also videos that discourage people from following safety measures - social distancing, wearing a protective mask, self-quarantine (Lima, 2020) - are considered malicious contents. A scientific research (Donzelli et al., 2018) on misinformation about vaccines reports that there is a correlation between distrust of official medicine and spread of information, proving how powerful virtual tools such as YouTube are. By October 2020, 200.000 videos were removed¹⁰⁹. Content moderators are not the only subjects who take care of content filtering, as YouTube disposes of an automated system that is able to detect harmful material and proceeds to remove it. Therefore, this platform brings together individuals and technology¹¹⁰. Another feature that was implemented are the information panels, to provide information about COVID-19 (and, more recently, also about the vaccine) to users. Occasionally, the panels can contain links that redirect the user to local sources, e.g. prevention centers or the health ministry. A breaking news shelf about Coronavirus can also appear on the *homepage* of YouTube¹¹¹. Lastly, YouTube edited its policy in relation to video monetization when it comes to Covid discussion. Initially, in March the policies did not allow monetization of video that included at least two passing mentions of COVID-19. However, considering that the rules¹¹² apply to short-term events, they had to be reviewed. It is now allowed for a restricted number of channels to include Covid in their videos. The monetization is, in any case, limited or entirely absent for contents that include: a distressing footage, medical misinformation, pranks (for instance the video uploaded by the channel “Kara.prank”, set in the metro of Moscow¹¹³) and challenges. YouTube recommends to always fact-check, follow both advertiser-friendly and Community Guidelines and to always try and be as sensitive as possible¹¹⁴.

¹⁰⁹ <https://europa.today.it/attualita/covid-youtube-rimuove-disinformazione-vaccini.html>

¹¹⁰ <https://blog.youtube/news-and-events/protecting-our-extended-workforce-and>

¹¹¹ <https://support.google.com/youtube/answer/9004474>

¹¹² The sensitive events policy is available at:
https://support.google.com/youtube/answer/6162278#Controversial_sensitive

¹¹³ For the full article: <https://www.bbc.com/news/world-europe-51457610>

¹¹⁴ <https://support.google.com/youtube/answer/9803260>

Conclusions

European Union has proven its efficiency starting from its immediate willingness to both coordinate actions and provide support to its member countries, and to collaborate with worldwide partners. When the very first cases of an unknown low respiratory infection were reported in France on January 24th, Europe activated its integrated political crisis response mechanism four days later, proceeding to invest funds in repatriation flights for European citizens. In March a large operation that involved all European states was put into place, namely the creation of the RescEU stockpile, which disposed of €380 million and a large equipment of medical tools. Litres of disinfectant, masks and various material were distributed among the member states according to their necessities, in addition to the collaboration and solidarity among them that was very well-coordinated. A second important action consisted in the allocation of funds. The first action undertaken less than a week after the first cases in France, was increasing the budget dedicated to the European research project “Horizon 2020”, financing 18 projects aimed at promptness and response, diagnostics, treatment and vaccines for COVID-19. In May eight more projects that concerned treatment and diagnostics of the novel coronavirus were launched, and involved the partnership of several institutions: universities, companies and public and research organisations. The healthcare gained support as well, thanks to the huge operation of RescEU, that led to the creation of a European stockpile. It included the coordination in the transportation of patients cross-border region and also the construction of mobile field hospitals, and country research on COVID-19. Certain European rules were softened, as well as banks’ regulations on expirations and money lending for SMEs. Support was provided also for workers, so that they could manage to keep their jobs, whereas towards the end of the first wave seventy-two companies were recruited for pioneering projects connected to the fight of Covid. The third, notable action undertaken to fight the virus involved social networks used world-wide. Although social networks were born as instruments for entertainment, they have become powerful means of transmission of news and information. For this reason, as we have seen, the two most important social networks decided to collaborate with the WHO and local health institutions to promote correct information and remove

malicious contents, that included videos, posts or “propaganda” of harmful and false concepts.

The operations undertaken by the European Union during the Covid outbreak in Europe, especially during the most critical phases, are the perfect demonstration of what must be done to reduce contagion, effects and also panic among people: first of all safeguard the immediate safety of individuals, in particular those who are at the current date majorly exposed to the danger. Secondly, invest as much as possible in material, scientific research, medical personnel, medical healthcare and private companies, to support the country’s economy during the most critical periods. Thirdly, educating people by the monitoring and spread of material and information in the most popular platforms online, thanks to the most powerful instrument of our millennium: the internet.¹¹⁵

3.2.2 Measures in Italy

This chapter aims at exploring the way Italy dealt with COVID-19 during the first wave. It is a noteworthy case-study as Italy was the first country in Europe to be struck by an important number of deaths and that had to endure Covid’s consequences. Pisano, Sadun, & Zanini (2020) declare that this wave constituted for the country the “[...]biggest crisis since World War II”.

At the beginning, the emergency was met with scepticism both from private and public subjects. Experts’ recommendations and warnings about the potential catastrophe that the virus could cause were ignored for long enough to allow the virus to create a situation that soon went out of hand. If we consider the rapidity with which the government took precautionary measures in Italy, we can argue that at the beginning the political response was slow and almost improvised. This is proved by the

¹¹⁵ Actually, a fourth additional operation that the EU undertook concerned the collaboration and solidarity with extra-EU countries. For instance, aid to China at the beginning of the pandemic and also 2 million surgical masks, 200.000 N95 masks and 50.000 testing kits from China to Italy (https://ec.europa.eu/commission/presscorner/detail/en/ip_20_613). However, to stay on topic and for reasons related to space availability, I have decided to analyze exclusively what happened within the borders of European Union - with the exception of the part dedicated to education and limitation of contents in the internet, as, due to its nature, it involved countries from all over the world.

fact that the first Ministerial Degree was emanated towards the end of February, long after the very first European cases of COVID-19, in addition to the fact that it still did not involve the entire country but mainly two regions, Lombardy and Veneto.

Pisano, Sadun & Zaini (2020) stated that “Italy followed the spread of the virus rather than prevented it” by taking partial solutions. The Italian model, although was later exalted by the New York Times¹¹⁶, postponed a general lockdown at all costs until the moment the situation was not endurable anymore. The strategy to cope with the crisis was based mainly on the emanation of a series of Ministerial Decrees (the so-called “DPCM”). During the first wave the Italian former Prime Minister Giuseppe Conte emanated fourteen decrees, all concentrated in a period of time of three months and a half, considering that the first one was emanated on February 23rd. We will see, mirroring chapter 3.2.1, the main policies that Italy applied and that constituted the core of the political action against the novel coronavirus. We firstly provide a general assessment on the contents of the decrees, pointing out the major changes, and we will analyze the use of decrees as a political instrument. Secondly, we will group up the most important measures that dealt with the containment of the virus and we will observe their application and development along the first wave. The measures consist of health communication portals, physical distancing, isolation and quarantine (maintaining essential services) and lastly healthcare service (infrastructures and workforce).

The Decrees by the President of the Council of Ministers

The Italian government managed the Covid emergency through the emanation of a series of law-decrees, that provided measures of containment and limitation of the diffusion of COVID-19. Initially, the Decrees almost exclusively concerned only two regions in the north of Italy, centers of the first outbreaks, that became “red areas”. From the second DPCM onwards, the measures were gradually spread to other regions as well. Limitations were applied mainly to circulation, education and cultural activities.

¹¹⁶ The article *Why can't Trump's America be like Italy?* by Paul Krugman is available at: <https://www.nytimes.com/2020/07/23/opinion/us-italy-coronavirus.html>

In addition, individuals had to use individual protection measures and everywhere dispensers of a disinfecting solution were available for everyone.

The sixth decree released on March 9th constituted the game-changer as the whole Italian territory underwent a complete lockdown. The decree (called *#iorestoacasa*, Eng.: “I stay at home”) eventually turned out to last 69 days, and further provisions were added by the successive decrees as well. Their fundamental points were:

- Prohibition of travelling outside the municipality, with the obligation of carrying around a self certification in paper form that had to be shown to authorities in case it was requested.
- Suspension of commercial retail and commercial activity, except for those concerned with the sale of food and “basic necessities”, including pharmacies and parapharmacies.
- All industrial and commercial activities - with the exception those specified by the decree - and gyms had to be temporarily shut down. The activities temporarily closed were still allowed to pursue their productive activities by means of agile work.
- Activation of distance learning mode by educational institutes.

The 11th decree of April 26th determined the beginning of the “second phase”, that would lead to a gradual reopening and reactivation of the economy. Businesses could resume their activities and slowly freedom of circulation was resumed too. With the 14th decree of June 11th almost every space was reopened and normal life routine was gradually recovered.

The use of decrees as a political instrument is, to some extent, controversial. A decree-law is an administrative act promulgated by the President of the Council of Ministers, whereas DPCM is a peculiar kind. On one hand, a decree-law involves the Council of Ministers too and must be converted by the Parliament into law within sixty

days. It protects civil liberties (Ita.: it is “garantista”) as the opposition’s participation is encouraged and both of the Parliament Chambers can propose an amendment. On the other hand, a DPCM does not involve the Council of Ministers, neither Parliament nor the opposition, as it is an exclusive competence of the President of the Council of Ministers. Moreover, just like a decree-law, it can limit several liberties guaranteed by the Constitution, i.e.: the freedom of movement (Art. 16), the freedom of assembly (Art. 17), religious freedom (Art. 19), the right / duty to education (Art.34), the freedom of economic initiative (Art. 41) and the freedom of movement (Art. 13).¹¹⁷

Due to COVID-19 pandemic, a state of emergency - governed by law 225/1992¹¹⁸ - was declared by the government. It grants broader powers to the government. The rule of law¹¹⁹ (Ita.: “riserva di legge”), however, imposes that a suspension of rights can only be achieved through the intervention of the Parliament. The Covid crisis, due to its unpredictable nature and its rapidity in the spread of the virus, required a quick intervention that the Parliament and in general the classical political instruments could not guarantee. The DPCMs seemed to be the most suitable instrument to manage this health emergency. Nevertheless, its notable number raised a heated debate on the hierarchy of the sources of law, namely which sources one shall use to suspend fundamental rights and freedoms.

The massive number of DPCMs issued raised concerns about the possible violation of the rule of law concerning the fundamental rights of the individual. Several rights have been derogated by The President of the Council, thanks to the DPCMs released to contain COVID-19, without any control or approval by the Parliament, President of the Republic or Constitutional Court. It has been argued that any kind of restriction of liberties sanctioned by the Constitution should be imposed through a law or, at least, a decree-law. According to the protests, being the Constitution the

¹¹⁷ <https://www.altalex.com/documents/news/2020/05/11/dpcm-e-costituzione>

¹¹⁸ The law, published on the *Gazzetta Ufficiale*, is available at: <https://www.gazzettaufficiale.it/eli/id/1992/03/17/092G0253/sg>

¹¹⁹ It is a principle according to which no subject is above the law. The creation and the enforcement of laws are themselves legally regulated. The rule of law prevents a misuse of power, translated in despotism, absolutism and totalitarianism (from: <https://www.ruleoflaw.org.au/what-is-the-rule-of-law/>)

fundamental law of the state, restrictions of the freedoms that it promotes should not be a power held exclusively by a single subject. Moreover, DPCM is a secondary source that is unknown to the Constitution (Carlesimo, 2020). This political instrument seems to almost represent a borderline between constitutionality and unconstitutionality. Concerning the issue of the alleged unconstitutionality of the DPCMs emanated during the Covid emergency, an Order of the Court of Rome of December 16th, 2020¹²⁰ claimed that the decrees issued from Conte were unlawful. The motivation was that “they have limited the fundamental rights provided for by the Constitution and the international conventions” and above all “an appropriate balance between the fundamental right to health and all other inviolable rights” was not undertaken.

Many websites reported the words of the judge, claiming that finally the DPCMs were declared unconstitutional and that, possibly, they could be cancelled. However, these assumptions are rather imprecise. The first inaccuracy, that can also be found in the article of *La Voce del Trentino*¹²¹ and *Il Giornale*¹²², is that it is not a court *judgement*, but a court *order*¹²³. The second inaccuracy that one should have considered is that a civil court has no competence in the constitutionality of a law, which is actually possessed by the Constitutional Court. However, any judge who doubts the conformity of a law with the Constitution, has the duty to turn to the Constitutional Court, which leads us to the third point - the judge could not refer to the Constitutional Court as the DPCM is an administrative act.¹²⁴ Consequently, no revision was triggered and the DPCMs issued during the Covid emergency were not revoked/cancelled/modified.

¹²⁰ Trib. Roma, Sez. 6° Civile, ord. n. 45986/2020 R.G.

¹²¹ The article is available at: <https://www.lavocedeltrentino.it/2020/12/24/la-sentenza-clamorosa-i-dpcm-di-conte-sono-illegittimi-e-incostituzionali/>

¹²² The article is available at: <https://www.ilgiornale.it/news/politica/sentenza-bomba-sui-dpcm-conte-sono-illegittimi-e-1912139.html>

¹²³ Essentially, the difference is that a court order is an act by which the judge decides definitively on a question. It is “stable”, meaning that it immediately binds not only the parties, but also the judge from which it originates, and can only be modified or annulled through its appeal before another judicial authority. On the other hand, an order does not close the process, but decides on a question of relevant importance that concerns it. It is neither stable nor definitive and it can be revoked. It is a much more flexible, limited decision-making provision (from: <https://www.laleggepertutti.it/219990-sentenza-ordinanza-decreto-differenze>).

¹²⁴ <https://quifinanza.it/editoriali/video/dpcm-conte-illegittimi/445783/>

Health communication portals

To contain the virus and prevent the transmission it is fundamental to inform the general public in the best way possible about how to prevent the contagion, how to identify the cases and keep track of the contacts with other individuals. First of all, it is of great importance to contrast fake news about the virus. According to an article of *La Repubblica* (D'Alessandro, 2020) more than half a million users of Twitter contribute to the spread of fake news on the Covid. In Italy one of the most prominent fake news propagandists is Alessandro Meluzzi, with seventy-five thousand followers on Twitter (@a_meluzzi). He is a former member of Parliament and in his biography he defines himself as "Psychiatrist, psychologist and psychotherapist, criminologist. Professor of Forensic Psychiatry. [follower of the] Ancient-Eastern Italian Autocephalous Orthodox Church."¹²⁵ In a post published on April 16th, he shared an interview with the American Shiva Ayyadurai - famous for spreading negationist theories - who (wrongly) stated that the virus could be contrasted by exposing oneself to the sunlight and by taking vitamin D¹²⁶.

Considering therefore the alarming situation concerning the rhythm in the spreading of fake news, on April the government decided to set up a *Unità di monitoraggio per il contrasto della diffusione di fake news relative al COVID-19 sul web e sui social network* (Eng.: "Monitoring unit to contrast the spread of fake news related to COVID-19 on the web and on social networks"). This task force aims at the analysis of the methods and sources of fake news spread. Furthermore, it investigates the involvement of citizens and social network users in strengthening the identification network and the impact of communication in relation to awareness campaigns¹²⁷. The official portals that provide preventive information are, firstly, the Ministry of Health. The MOH dedicated an entire section to COVID-19 that publishes, among the general preventive information, data, national measures, FAQs and advice. The MOH relies also

¹²⁵ https://twitter.com/a_meluzzi

¹²⁶ https://twitter.com/a_meluzzi/status/1250873462073233412

¹²⁷ <https://informazioneeditoria.gov.it/it/notizie/unita-di-monitoraggio-per-il-contrasto-della-diffusione-di-fake-news-relative-al-covid-19-sul-web-e-sui-social-network-adottato-il-4-aprile-il-decreto-di-istituzione-presso-il-dipartimento/>

on social network platforms (Facebook, Twitter, Instagram) and TV advertisements where it promotes the hashtag *#iorestoacasa*. Secondly, the Department of Civil Protection is employing a great effort to contrast the Covid by collaborating with the regions. In particular, during the first wave it provided daily updates through live streams on TV and on their YouTube channel. Thirdly, the National Institute of Health (*Istituto Superiore di Sanità*) dedicated the portal called *EpiCentro* for data related to COVID-19. In addition, it organized Webinars and distance-learning courses and published a guide that explains how to manage domiciliary isolation both of positive cases and of individuals who had contacts with them¹²⁸. An additional initiative designed to cope with Covid information is a chatbot developed by Microsoft for the *INAIL* website (the national institute against accidents at the workplace). The chatbot provides information to the users about self-assessment of symptoms in order to reduce overcrowding and overwork at healthcare facilities¹²⁹. Another initiative, called “ask the expert”, was developed by the pharma company Bayern and was later adopted by the region of Lombardy. It allows users to upload exam results or images and obtain the advice of an expert.

Physical distancing, isolation, quarantine

Italy was the first country in Europe to introduce social distancing to prevent the further spread of Covid. As we have seen in point b), the measures were introduced gradually however they turned into a full lockdown with the DPCM of March 9th, as they entered into full force on the 10th. The decrees released between the 9th and 22nd led to forbidding movements from and to the municipality where one lives. The only travels allowed included work and health reasons, and citizens had to carry a self-declaration in paper form that justified the movement, otherwise they had to face criminal charges.

In any case, whoever had a body temperature of 37,5°C and symptoms attributable to COVID-19 was recommended to stay at home. Those who tested positive

¹²⁸ The guide “Indicazioni *ad interim* per l’effettuazione dell’isolamento e della assistenza sanitaria domiciliare nell’attuale contesto COVID-19” is available online at: https://www.iss.it/rapporti-covid-19/-/asset_publisher/btw1J82wtYzH/content/id/5292564

¹²⁹ <https://www.inail.it/cs/internet/comunicazione/news-ed-eventi/news/news-chatbot-autovalutazione-covid-19-2020.html>

were forbidden to leave their home. The commercial exercises had to be able to guarantee the safety measures, including the social distance between customers. On the 14th a protocol containing the guidelines for work security was implemented by the government. The document, made of thirteen articles, stated that workers' temperature could be checked at the workplace. Access to the work structure was forbidden to those with a 37,5°C body temperature but also to any individual who in the last fourteen days had contacts with positive subjects or anyone who travelled to red zones. Other measures introduced by the protocol included the management of movement of people and sanitization of the environment, the obligation to wear a face mask, the way to cope with suspected cases and the encouragement to implement smart working modes¹³⁰. Afterwards, to further avoid social contacts the activities of non-essential businesses were suspended and jogging was banned as well.

Whoever tested positive for Covid had, and still has to, endure a period of isolation and quarantine, possibly at home in a dedicated room and with a dedicated bathroom. This is necessary to not overload healthcare structures. The room where the person quarantines needs to be regularly ventilated and the surfaces touched by the infected subject must be sanitized, while his/her laundry must be washed separately. Quarantine and isolation last until the patient fully recovered and tests negative. In case difficulties in breathing occur, the person must contact the emergency services¹³¹. A number of phone apps and websites have been elaborated to support quarantine and isolation of the individuals. Some of the apps approved on the governmental level are:

- *Immuni*, developed by the Health Ministry, alerts those who might have been exposed to the virus. It employs a technology that does not lead to data collection of the user.
- *Axistance Covid-19 Control*, which was developed by Enel X Italia and is beneficial to health centers.

¹³⁰ <https://www.inail.it/cs/internet/docs/alg-protocollo-14-marzo-sicurezza-lavoratori-covid-19-2020.pdf>

¹³¹

<https://www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=2020&codLeg=74178&parte=1%20&serie=null>

- *eLifeCare Covid-19*, by the company Exprivia S.p.A., monitors vital parameters, offers self-assessment questionnaires and is, in general, aimed specifically at assisting people in quarantine and isolation.

Healthcare service (infrastructure and workforce)

As far as healthcare service is concerned, the increasing cases of COVID-19 led to a crisis in the concrete management of the emergency. In fact, the health facilities and infrastructures were not conceived on the basis of possible epidemic outbreaks. Tendentially, epidemics were thought of elements that belonged to the past or to poorer countries thanks to the progress of medicine and science, nevertheless as we have observed in chapter two diseases and new illnesses travel rapidly and they can be, at times, very unpredictable. The Covid pandemic, just like one has observed with some case-study in the previous chapter, caught the countries unprepared. However, while the politics were able to react and contrast the issue relatively quickly, the infrastructures and workforce could not be adapted to the new situation efficiently within the short period of time required in order to limit, contain and eventually stop the pandemic.

To face the lack of workforce, the Italian Army intervened and addressed the needs of the healthcare by supplying servicemen and servicewomen, military infrastructures and a few ambulances as well. The soldiers were employed all across the territory for the so-called *Operazione Strade Sicure* (Eng.: “safe roads/streets operation”)¹³², that in this context patrols the roads to monitor the correct application of the COVID-19 measures¹³³. The aeronautics contributed by transporting medical and respiratory assistance equipment via airplane. In particular the airmen were concerned with the transfer of patients from the north of Italy on special isolated stretchers¹³⁴.

¹³² The *Operazione Strade Sicure* was put in place in 2008 with the Berlusconi government, the goal is to contrast delinquency and terrorism. It was extended in 2019. (From: http://www.esercito.difesa.it/operazioni/operazioni_nazionali/pagine/operazione-strade-sicure.aspx)

¹³³ http://www.difesa.it/Primo_Piano/Pagine/Esercito-per-il-Paese.aspx

¹³⁴

http://www.difesa.it/Primo_Piano/Pagine/ministero_difesa_contro_coronavirus_aeronautica_per_emergenza_sanitaria.aspx

An issue that hospitals had to solve in the quickest way possible was the limited number of bed places in the critical care wards. On March 10th, the day in which the first Italian lockdown began, the places in the Italian territory were 5.200, of which 900 were private. Within fifteen days an amount of 1.500 critical care beds were added. Furthermore, ventilators were delivered as well, for those patients to whom COVID-19 affected the lungs. The production of ventilators and medical material had to intensify its efforts to face the lack of equipment in the Italian territory (Logozzo, 2020). However, bed places and medical equipment were gradually incremented in the following months too, in particular the bed spots reached a number of around 9.000¹³⁵. On May 19th the Health Minister launched a programme, for the total amount of €3,25 milliards, that included various measures to improve and fortify the public health system. A part of the investment was employed to enhance the territorial service, e.g. home assistance, home monitoring and contracts with reception structures and laundry facilities. Other portions of the budget was invested to build healthcare infrastructures specifically for the treatment of COVID-19 cases - as “mixed” hospitals have a higher risk of contagion - , for critical and semi-critical care wards and lastly for special middles of transportation for patients infected with Covid. Lastly, a third part of the investment for the programme was spent on medical personnel’s incentives, formation and recruitments¹³⁶.

Conclusions

In the context of the interactions capitalism - Covid emergency, the journalist Penny (2020) states:

“The tiny-minded incompetents in charge cannot handle a problem that can’t be fixed simply by sacrificing poor, vulnerable, and otherwise expendable individuals. Faced with a crisis they can’t solve with violence, they dithered and whined and wasted time that can and will be counted in corpses.”

¹³⁵ <https://www.open.online/2020/08/11/terapie-intensive-seconda-ondata-coronavirus-ospedali-situazione-italia/>

¹³⁶

http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministero&id=4756

This strong criticism was aimed at the lack of efforts of the politicians in dealing with COVID-19 crisis, as they were apparently more concerned with safeguarding their monetary interests instead of taking care of human lives. On one hand, it is necessary to point out that - referring to the Italian case - the reaction could have been quicker. The measures against COVID-19 in Italy were implemented gradually. The first DPCM was published towards the end of February and should have probably introduced measures and limitations on the entire Italian territory. Instead, the actions followed the spread of the virus instead of proceeding ahead of it. Substantially, they were activated as soon as the contagion became an emergency instead of preventing the emergency itself. On the other hand, it is fair to point out that the political activity was subject to intense pressure as the COVID-19 spread quickly and created new outbreaks overnight. The numerous decrees, fourteen within four months, proved that the government worked frantically in order to monitor the situation and find suitable ways to cope with it, although they raised concerns regarding their constitutionality. The spread of fake news about COVID-19 had to be contrasted as well as it could give rise to dangerous situations, and they probably slowed down the government's work. For this reason, a task force was set up and the Health Ministry, the National Institute of Health and even the *INAIL* reserved a space on their websites for reliable information and data about Covid. In particular, *INAIL* has a chatbot and likewise Bayern instituted the "ask the expert" service.

Regarding physical distancing, quarantine and isolation, clear instructions were issued from the most important institutions. They concerned limitations in the freedom of movement and circulation of individuals, who had to justify any movement during the lockdown by means of self-certification. To enforce the importance of these measures, whoever violated them could face criminal charges and high fines. Its importance was also underlined by the fact that gradually, from each DPCM to the successive ones, some verbs changed from "should" to "must". A number of apps were developed in order to assist and support both healthcare professionals and individuals who had to endure quarantine and had to stay isolated. Technology gave once again a great contribution in the spread of news and correct information. The subjects that suffered particularly for the Covid emergency and had a less degree of flexibility were the infrastructures and

workforce. It was technically not possible to improve them and employ infrastructures and medical personnel within the short period. Nonetheless, the military offered its collaboration to monitor the respect of measures and transport both equipment and patients. The critical care wards were enlarged, territorial services were improved, and the medical workforce enjoyed some benefits thanks to the allocation of large funds.

3.3 Reactions of people

The fear of the new coronavirus grew hand in hand with the most bizarre theories. Dissemination of misinformation and fear contributed - and still does - to spread panic among people, who in turn tried - and tries - to elaborate fast solutions and simple explanations about our new situation of living. This is especially true and is largely present in the virtual world, in particular social networks. Social networks and the net overall are the spots where theories, fast explanations and fast solutions are rampant - they circulate quickly and can never be fully erased. There is always someone who remembers the fact or someone who screenshotted the content that was banned, whether a comment, an article, and so forth. Re-starting a thread and brushing up old or banned facts (in the form of posts, videos or comments) is rather quick, inexpensive and above all can be at times performed anonymously or under a false identity thanks to the lack of rules that govern the net.

What we want to do in this chapter is investigate what kind of reactions the COVID-19 emergency has sparked among people. Among the countless reactions and theories, the most prominent ones are those that established themselves after the germ theory, i.e. no-vax, scapegoating, racism. To these old theories we will observe new additions, namely negationism, conspiracy theories and no-mask movements. Perhaps, it is the contemporary climate of freedom of speech that encouraged any kind of individual to state their own "truth". These individuals not only feel encouraged, thanks to their misuse of freedom of speech, to state and spread false information, but also feel empowered. The internet and social networks constitute a powerful instrument, accessible to everyone, and could at times give a sense of strength and confidence. As a

matter of fact, one of the meanings of “empower” according to the Cambridge Dictionary online - that we will take into account for our arguments - is “to give someone [...] the freedom or confidence to do something”.

Fake news is not a new phenomenon as it already emerged some centuries ago. As for its modern manifestation, Riva (2018: 20 et seq) reports that according to some intellectuals the modern fake news was born in a very recent time, between the end of 2015 and the beginning of 2016, namely during the American presidential elections. Although it is not possible to establish a specific date that indicates the starting point of its modern manifestation, it is possible to recall different episodes that were supported by fake news. For instance, Riva states that the Russian government was able to exploit and study the phenomena of fake news in order to bring about anti-Americanism sentiments. The episode exploited was HIV, the Russian government induced the assumption that it was created by the US government in its laboratories. Fake news, shared through social networks, becomes “social facts”. These are events of which the truth does not rely on evidence, instead it is based on the activity of the social network of which we take part. Riva reports the example of marriage. Essentially, “husband” or “wife” is not determinable by the observation of the physical world, but rather of the features of the social network of which the person is a part. Through marriage you become a husband/wife. Decisions are mostly influenced by social facts, as its coercive power relies on the ability to stimulate a sense of belonging to a group. The larger the group, the stronger the coercive power on the single individual. This is the motivation that leads someone to believe and share information, whether fake or true.

Online, this coercive power is often connected to the figure of “social influencer”. This individual has the capacity to “have an influence on the public opinion in relation to a certain topic”.¹³⁷ In this sense, a politician can be an influencer as well. As Riva (2018) highlights, these social models can become a reference point for a group of people not because of their actual skills or knowledge, but for their sole ability of attracting a large number of followers. These kinds of individuals might coincide with the ones who create and/or spread fake news, which can be constructed by following a

¹³⁷ <https://accademiadellacrusca.it/parole-nuove/influencer/17669>

similar pattern. Firstly, one creates a digital community that gathers individuals with a common objective. Secondly, one promotes leading figures that aim at the support of fake news. Lastly, these fake news are introduced in the digital community as social facts linked to the failure to achieve the shared goal, by saying that the individual/group X acted in a way that jeopardized their common and shared values. For instance (as we will see in detail in point b), one creates a right/left-winged group of sympathizers and the common goal is to avoid vaccination against COVID-19. Then a prominent figure from the left/right (the specific political party this person is from is not necessarily relevant) - who is able to gather a remarkable number of followers - comments, shares and publishes contents in relation to the vaccinations. The issue is that the contents with which this politician-influencer interacts are not simple and plain facts that support the common goal, but usually fake news. The main feature of fake news is that they aim at triggering the emotions of the reader. Typically, their leverages are the stereotypes and prejudice spread in a society. Fake news aims at provoking immediate emotions, e.g. anxiety, anger, scorn and frustration (Riva, 2018: 18, 19). For this reason, the contents shared by this individual will be social facts linked to the failure to achieve, for instance, non-mandatory vaccines. The result is that the followers will inevitably support the indignation expressed by the politician-influencer. Within the same group, it is difficult to detect followers that contrast the leader due to the abovementioned sense of belonging to a group.

In respect of the link between social networks, fake news and its coercive power, Leach (2018) notices:

“On the platforms themselves, notably Twitter, it builds into the angry mob. Twitter is now a vehicle for social coercion. And this mass coercion has no legal or social framework to limit its powers. Outrage is easy to stoke. Mobs gather round opinions whether or not they are based on fact. Those flames are easy to stoke, and, increasingly, these apparent mobs of private citizens are driven by armies of bots[...].”

As previously observed in the second point of chapter 3.2.2, some social networks, in particular Twitter, are exploited in terms of spread of misinformation. However, as Leach points out, it is not only physical persons that actively engage in this activity, but also “armies of bots”. Bots are programmes able to perform tasks

automatically, that on social networks can pretend to be a real person. Thus, if plenty perform and share the same activity, e.g. push a particular issue, information or statement a notable number of physical people can end up being engaged and interested. For this reason, bots are also often used to promote advertisements as well as products¹³⁸. Bots, used in social networks that nowadays are a massive vehicle of social gathering, truly have the power to shape the mentality and ideas of the mass, favoured by the lack of legal and social framework.

What we want to analyze in this part is the final process in the spread of fake news and misinformation, namely what they generated in terms of reactions in the population, correlated by some examples from the digital communities. We will focus mostly on Italy, as it was one of the epicentres of COVID-19 outbreak in Europe and the first country to impose strict measures to contain the epidemic, thus one could rightfully expect positive reactions from the population, also thanks to the large campaign of information that was undertaken since the very first cases of Covid. First of all, we will see what negationism of COVID-19 consists of and the theses that support it. We will do so by analyzing a pseudo-negationist movement's website and the declarations released during interviews that were uploaded on YouTube. We will also see some prominent figures in the field of Italian Covid negationism, namely Roberto Fiore, Giuliano Castellino and Sara Cunial¹³⁹. Next we will discuss the conspiracy theories that so far have had the largest success in Italy and that involve an alleged new world order, Bill Gates, the 5G network and the "vaccine-microchip". Secondly, we will analyze the phenomena of no-vax and no-mask, once again by trying to detect the underlying reasons that motivate their followers. As for no-mask, their conviction that face masks are harmful for health. As for no-vaxxers, the assumption that vaccines contain parts of aborted fetuses, that they can cause autism and lead to the so-called "homologous recombination" (i.e. DNA modification) and that they are polluted with heavy metals.

¹³⁸ <https://www.bbc.co.uk/bitesize/articles/zjhg47h>

¹³⁹ We chose these three individuals in particular due to their different backgrounds and relevance today. We can observe different applications of Covid negationism. Fiore has a past rooted in fascism, and is now a member of Forza Nuova like Castellino who, recently, assaulted some journalists. On the other hand, Cunial is in a particular position as she is a member of the Parliament, showing that no field is immune to the irrational belief that is negationism.

We will shed a light on these misperceived facts and/or fake news. We will also see concrete examples of the negative emotions triggered by fake news in those individuals that believe them. Lastly, we will see in which ways COVID-19 pandemic has created a fertile ground for scapegoating and racist behaviours.

a) Negationism and conspiracy theories

Negationism is, just like fake news, not a new phenomenon. In the past, the most shocking negationist pseudo-theory that emerged was the one that affirms that holocaust during the Second World War never existed. In our most recent times, although this pseudo-theory unfortunately was not completely erased from the most radical group of people, a new one emerged: negationism of Covid. It is very bizarre to realize that there are groups of individuals who are deeply convinced that, despite the progresses of society, education and scientific evidence the pandemic does not exist. In our analysis we will try to outline what the argumentations of COVID-19 negationists are. Secondly, we will see why some individuals state that Covid is linked to some conspiracy theories.

Negationists find large consensus in the virtual space of the internet, where they spread their ideas and pseudo-scientific theories by means of hashtags. In fact, their protests and demonstrations begin in the social network platforms and at times translate into the “real life”, in public spaces, in the form of demonstrations. As we will see in *Barbascura X's* video and in Sara Cunial's intervention in the Parliament, negationists' theses are based on the premise that Covid does not exist. Accordingly, COVID-19 and the sanitary emergency was created by unspecified “strong powers” that act under orders of politicians. The purpose would be to impose a “sanitary dictatorship” - as claimed by the movement “Marcia della Liberazione” - and a coercive surveillance on the population, in order to gradually restrict and cancel liberties and civil rights. In Italy a movement was born in order to free the Italian population from the alleged dictatorship that is being imposed. It is called *Marcia della Liberazione* (Eng.: “freedom march”) and, in its website - www.marciadellaliberazione.it - it lists its “Ten Commandments”. It is remarkable to note that the choice of vocables is clearly an allusion to religion, as if these claims were sacred and therefore respecting them is a

moral duty. The “Commandments”, however, barely refer to COVID-19, which is mostly used as a pretext to contest unrelated topics. It is possible to observe mentions of monetary sovereignty, multinationals, reduction of taxes, public debt, 5G connection, banks, democracy and freedom. Only two of these “Commandments” are related to health: #7 mentions the freedom of therapeutic choice, #9 demands more investments on public health¹⁴⁰. It is possible to deduct that the goals of the negationist movement are very broad, reducible to a generalization that collects generic problems involving the economy and society. They only vaguely revolve around the core of the issue - the alleged sanitary dictatorship - without getting to the nub of the problem.

It is important to highlight that in the website of *Marcia della Liberazione* there is not an evident declaration that COVID-19 does not exist. However, from the interviews to the participants filmed during the demonstration of October 10th, 2020, their scepticism and statements demonstrate the opposite, showing that some of these protesters do believe that Covid is a fiction. The lack of transparency and confusion in the demands of the negationist movement and negationism assumptions can be observed in the interviews released to TV programmes and TV news as well as social network platforms. The youtuber “Barbascura X”, who is a Ph.D. student and was also assigned a Marie Skłodowska-Curie fellowship in chemistry¹⁴¹, uploaded a video in his YouTube channel with some interviews he personally filmed at the *Marcia della Liberazione* demonstration of October 10th. The youtuber ironically comments on the claims that he was able to collect and refutes each of them in his 48 minutes video. Similarly to the “Ten Commandments” of *Marcia della Liberazione* website, the statements and ideas that can be detected are quite puzzling and confusing. For instance, a man declares: “I think we are better off if we stay [physically] closer. Staying away from one another is not good for one’s health. We must keep ourselves healthy”; a woman states: “No one dies from this virus, cause it’s just a f***ing flu”; a third person calls COVID-19 a “fantavirus”. Another individual claims that “it’s a dictatorship because the Covid does not exist”. As the youtuber also comments, in the interviews collected in

¹⁴⁰ <https://www.marciadellaliberazione.it/>

¹⁴¹ He has a profile on ResearchGate, available at: https://www.researchgate.net/profile/Pierluigi_Tosi

his video during the demonstration it is possible to observe two kinds of negationists. The first type denies the existence of the virus itself, whereas the second one denies the existence of the victims of the virus and/or the utility of the measures.

Some notable Italian exponents of COVID-19 negationism include Roberto Fiore, Giuliano Castellino and Sara Cunial. Fiore, born 1959, was part of a neo fascist movement in his youth. He fled to London to escape the arrest warrant connected to his involvement in the terrorist attack at Bologna train station in 1980 that counted eighty-five victims and two hundred injured. He returned to Italy nineteen years later, in 1999, when the statute of limitation for his alleged crimes expired. In Italy he joined the party *Forza Nuova* (Cipolla A., 2020). In his Twitter profile, Fiore, former member of a neo-fascist movement that by definition supported a dictatorship, wrote in his description “no to sanitary dictatorship”¹⁴². Moreover, during a demonstration in Naples on October 24th, 2020 Fiore supported the attitude of civil disobedience against measures related to the Covid emergency. Although he did not specifically state that Covid does not exist, his claims reflect the statements heard from many negationists: “[...]the lockdown rules [...] are totally illegal, unconstitutional and unpopular. This is why we believe it is right not to respect them”¹⁴³. Giuliano Castellini, another member of *Forza Nuova* party, has a history of aggressions to journalists¹⁴⁴. During the demonstration he released an interview making his negationist position very clear. He in fact stated that the truth has to be spoken, as “no one has ever died of Covid, it is easy to heal from it, it is not true that critical care wards are full”. He released his interview without wearing a face mask (Tiziani, 2020). Although he does not clearly deny the existence of the virus itself, the position he took qualifies him as a negationist, as he denies the virus’ effects and dangerous nature, attributing the lockdown rules to a mere initiative of the government to deprive the population from its freedom and to assert itself above the Constitution.

¹⁴² <https://twitter.com/RobertoFioreFN>

¹⁴³ Translation from Italian: “[...]le norme del lockdown [...]sono totalmente illegali, anticostituzionali e antipopolari. Per questo riteniamo che sia giusto non rispettarle.” (Source: https://www.adnkronos.com/fiore-no-a-dittatura-sanitaria-pronti-a-disobbedienza_4AXTCbvo7i4kghhoP4hxVB?refresh_ce)

¹⁴⁴ In January 2019 he assaulted journalists of *L’Espresso*. The article that reported the attack is available at: <https://espresso.repubblica.it/attualita/2019/01/07/news/vergognosa-aggressione-fascista-a-roma-contro-i-giornalisti-de-l-espresso-1.330219>

The third personality is Sara Cunial, who in 2019 was expelled from the political party *Movimento 5 Stelle* because of her anti-vaccine positions. During a public demonstration on September 10th 2020, a video¹⁴⁵ reports that she tried to kiss a journalist who was interviewing her to prove to him that Covid does not exist. She declared that she never uses the face mask, because “you get sick while using the mask”. Her role is also very prominent in the conspiracy theories, and she takes her personal ideas to the Parliament: on May 2020 she performed an intervention during which she mentioned Bill Gates and his alleged crimes, a “quantic tattoo”, hypothetical vaccines that would reboot our immune system, the “deep state” and a number of other controversial accusations and topics¹⁴⁶.

As for conspiracy theories, the first one involves an alleged “new world order”. Some interviewees in the aforementioned video of “Barbascura X” offer an explanation of the reasons for COVID-19 pandemic. Encouraged by the youtuber, a man quotes Orwell, saying that in the book *1984* the writer states that “before falling, a government that does not enjoy popular consensus anymore drops an epidemic that kills the 80-90% of the people”. The man specifies that by “government” he does not mean the Italian government, but instead the new world order, that would be composed of the so-called “American deep state but also the universal deep state”. Pressed and encouraged by Barbascura X’s comments and questions, the man exposes the entire theory, stating that it is thanks to this new world order that China became “the universal producer” (he does not further specify what kind of production he refers to), as “it was asked to [become the universal producer]”. The interviewee proceeds by mentioning a series of issues that he deems linked to what we - for convenience - could call the “COVID-19 conspiracy”. He claims the existence of groups of people, alleged “pedo-satanists” that would draw liquid from “scared children’s brains”, employed as an “elixir of life because it regenerates the cells”¹⁴⁷. The youtuber, after this elaborate discourse, asks the man how

¹⁴⁵ The video is available at: <https://www.youtube.com/watch?v=o5Zvs07wm1c>

¹⁴⁶ The commented speech is available at: <https://www.open.online/2020/05/15/coronavirus-lintervento-della-deputata-sara-cunial-e-i-numerosi-complotti-sul-covid-19-e-non-solo/>. Cunial is a plotter and supporter of no-mask and no-vax movements. We will mention her in point b) as well.

¹⁴⁷ This pseudo-theory traces back to another conspiracy theory, called *QAnon*, born in the US and spread mostly in the democratic countries. According to it, Donald Trump is secretly waging a war against the satanist-pedophile élites that allegedly “hide” in the government, media and business. This conspiracy

these facts would be related to the Covid to which the man replies that, since the virus does not kill anyone anymore, it is simply used as a pretext to establish the new world order.

A second conspiracy theory involves Bill Gates, who became a main target for the polemics of plotters, most likely for his well-known position of capitalist and the great power administered through his possessions. The conspiracy theory involving Gates dates back to several years ago and the common thread are the vaccines. It began when in 2002 an interview was published on *The Wall Street Journal* (Bank & BuckmanStaff, 2002), reporting that the *Bill & Melinda Gates Foundation* purchased \$205 million of shares in nine big pharmaceutical companies. During the following four years, no-vaxxers exploited the article to raise doubts on the apparent good intentions of Gates¹⁴⁸. However, the first actual conspiracy theory on Gates was born in 2010 thanks to the American far-right radio show host Alex Jones who listened to Bill Gates' speech "Innovating to zero" on climate change during the TED talk¹⁴⁹ of the same year¹⁵⁰. According to Jones, Gates is part of a global population-reduction scheme that was revealed thanks to a statement he released during his speech:

"The world today has 6.8 billion people. That's headed up to about 9 billion. Now, if we do a really great job on new vaccines, health care, reproductive health services, we could lower that [population growth rate] by perhaps 10 or 15 percent".

The statement was taken out of context and re-interpreted as Bill Gates' manifest intention to reduce the ability of human beings to reproduce, make them infertile¹⁵¹ and eventually lower the human population. This misrepresentation ended

theory blew up recently after the storming of the US Capitol on January 6th, 2021 (From: <https://www.bbc.com/news/53498434>).

¹⁴⁸ A series of theories, dating back to 2006, were published in the following website: <https://100777.com/node/1331>

¹⁴⁹ TED Talks are videos of experts on various subjects. Its aim is to spread ideas, usually in the form of short talks of 18 minutes or less. From: <https://www.ted.com/about/our-organization>

¹⁵⁰ The speech is available at: https://www.ted.com/talks/bill_gates_innovating_to_zero

¹⁵¹ On April 29th, 2020 the media portal of the Kremlin *Georgia and the World* published an article that claimed that Gates created vaccines to "cause infertility and annihilate human's ability to reproduce". The article is available at: <http://geworld.ge/ge/%E1%83%91%E1%83%98%E1%83%9A-%E1%83%92%E1%83%94%E1%83%98%E1%83%A2%E1%83%A1%E1%83%98->

up becoming the representation of Gates as one of the powerful men who are part of the “new world order” that aims at the reduction of population. However, an investigation of Gates’ statement within the actual framework of its context is enough to take away any possible doubts related to the meaning of his claim. Gates was in fact speaking of the “child survival hypothesis”. Essentially, he pointed out that vaccines have the capacity to reduce child and infant mortality in poorer countries. In fact, parents would have less children if the probability of their survival is higher. The lower number of children will have more possibilities to achieve an education, be supported and receive aid for issues concerning their health and overall, their living condition would improve and poverty could be overcome¹⁵². Therefore, less child mortality would be connected to a reduced population growth.¹⁵³

A third conspiracy theory involves the 5G network, which was implemented in 2019. In the first months of 2020, the assumption that 5G would spread the COVID-19 began to take hold. The pseudo-scientific background is related to the “guru” Thomas Cowan (born 1944)¹⁵⁴, who stated that electromagnetic waves are directly linked to the diffusion of the illness¹⁵⁵. In an article published in *La Voce del Trentino* in March 2020 during the first Italian lockdown, the author reports the statements of several professors and medics to support the thesis that the diffusion of 5G coincided with the diffusion of the Coronavirus. She then proceeds to ruefully conclude her article stating “Stop looking for it [the truth], this is really the end, the real death of the human race” (Corrente, 2020). This conspiracy theory was refuted by proving that, just like it happened with Bill Gates’ TED speech, some scientific studies were misinterpreted¹⁵⁶. WHO’s website page

[%E1%83%95%E1%83%90%E1%83%A5%E1%83%AA%E1%83%98%E1%83%9C%E1%83%94%E1%83%91%E1%83%A1-%E1%83%90%E1%83%93%E1%83%90/](#)

¹⁵² See also chapter 1.3.2 The vital strategies.

¹⁵³ <https://facta.news/storie/2020/05/14/perche-bill-gates-e-diventato-il-bersaglio-perfetto-per-le-bufale-sul-coronavirus/>

¹⁵⁴ Thomas Cowan’s book *Vaccines, Autoimmunity, and the Changing Nature of Childhood Illness*, published in 2018, describes the theory according to which the increase of illnesses, disabilities and disorders in the past fifty years is due to our vaccination policy.

¹⁵⁵ <https://www.youtube.com/watch?v=9-ZIUxMORF4>

¹⁵⁶ For reasons related to space and to stay on topic, we cannot explain which are all the false assumptions connected to the interference of electromagnetic waves and the human body and how they were/are refuted. However, an online article that collects various hypothesis and explanations (and external links

of *Mythbusters* clearly states that COVID-19 is transmitted via airborne droplets and not radio waves/mobile networks¹⁵⁷. In addition, the website of the Italian Health Ministry claims that no scientific evidence indicates that COVID-19 and the 5G network are correlated and that the virus infected also countries that do not dispose of the 5G¹⁵⁸.

A final conspiracy theory that is worth mentioning concerns the one that involves the correlation of COVID-19 vaccine and microchips. The blog *Blondet & friends* - managed by Maurizio Blondet (1944), who is an Italian journalist, essay writer and blogger - published on April 8th, 2020 an article entitled *ARRIVA! la truffa chiamata vaccino* (Eng.: It's coming! the scam called vaccine). It mentions the experiment called *PittCoVacc* that involves a "plaster-vaccine", elaborated at the University of Pittsburgh and tested on mice. This type of vaccine was financed and recommended by *Bill & Melinda Gates Foundation*. Accordingly, the vaccine is administered in the form of a plaster-like device formed by four-hundred tiny needles that melt in the surface of the skin within a few minutes. These needles release the antigen that triggers the immune response and no bleeding is involved. The alleged problem would be caused by the mark that this device, once melted and absorbed by the skin, would leave. According to the supporters of this theory, the "plaster-vaccine" would leave a tattoo, invisible to the human eye, that can only be identified and read by the "ad-hoc electronic reader", that gives information about the identity of the person and whether he/she received the vaccine or not. The protest against this kind of vaccine is based on various motivations. In fact, the mark would be a quantum¹⁵⁹ tattoo, that not only releases antigens but also inject into the body "microscopic semiconductor crystals" that would be exploited by,

of its sources) linked to this conspiracy theory is available at: <https://www.open.online/2020/03/30/coronavirus-il-5g-penetra-nelle-cellule-indebolendo-il-sistema-immunitario-no/>

¹⁵⁷ <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/myth-busters#5g>

¹⁵⁸

<http://www.salute.gov.it/portale/nuovocoronavirus/archivioFakeNewsNuovoCoronavirus.jsp?lingua=italiano&tagId=1308>

¹⁵⁹ Quantum, in physics, is the smallest amount or unit of something, especially energy (from: <https://dictionary.cambridge.org/it/dizionario/inglese/quantum>).

most likely, the government¹⁶⁰. It is not possible to avoid the procedure as every person would be checked and those who were not marked by the “quantum tattoo” would not be allowed to return to their workplace. Therefore, the government would force everyone to be “microchipped” as a compromise for returning to our everyday life and be able to rely on an income. Alternatively, we would not “regain our salary” and perhaps not even see our family, partner and children as we would be deported to not infect them. This conspiracy theory includes the additional dangers of the alleged microscopic semiconductor crystals, namely the exploitation of this feature to include a number of additional information about the individual, not related to his/her sanitary status. The article claims, in fact, that “Someday it may contain information on your current account, your sexual tastes, your criminal record” (Blondet, 2020). The problem concerning the conspiracy theory described arises from the fact that there are no solid proofs to demonstrate what it is claimed. The tiny needles described in the article are novel microneedle array¹⁶¹, soluble once they penetrate the skin. It is not clear why the author refers to alleged semiconductors or “quantum” tattoos. Moreover, it is not explained in which way these microneedles would act as microchips and even control us, our life or our actions.

The interaction and support that these fake news receive is notable. The article by Maurizio Blondet counts 127 comments¹⁶². The thread covers a large group of topics, whereas some of the commentators expose their own view to show their support. By reading through them, what emerges is a large consensus in relation to a general assumption that someone located on the apex of a hypothetical hierarchical scale is trying to control everyone, to gradually lead the society to obedience and subservience. Apparently, the users all agree on the fact that the “new world order” - or, as the user

¹⁶⁰ While reading the various conspiracy theories, it is possible to notice that it is hard ever specified *who* has an interest in exploiting “us”. Usually, the plotters refer to these subjects as “them”, other times some entities, usually an alleged “new world order”, are mentioned. It is possible to hypothesize that in some cases the accusations are brought against the country’s government, for instance the case of “plaster-vaccines”.

¹⁶¹ This technology is described in the research paper by E. Kim et al., *Microneedle array delivered recombinant coronavirus vaccines: Immunogenicity and rapid translational development*, available at: [https://www.thelancet.com/journals/ebiom/article/PIIS2352-3964\(20\)30118-3/fulltext](https://www.thelancet.com/journals/ebiom/article/PIIS2352-3964(20)30118-3/fulltext)

¹⁶² Last access to the webpage: 16/01/2021.

D. calls it: One-World Government - is trying to transform us into a massive army of slaves. The connecting dots are the 5G, the vaccine that is actually a microchip/a quantum tattoo, alleged secret projects (that, somehow, only plotters are aware of), a series of historical events that according to plotters are not casual and a number of relevant personalities, including the former Pope Benedict XVI, Kissinger, Rockefeller, Soros. To the whole bunch, someone quotes religious elements. An example that encompasses all these elements is the comment of the user C.:

“This is much more frightening than the simple vaccine. Actually, the quantum tattoo in question is the focal point of a project called ID2020. The old Kill Bill Gates and his other accomplices want to impose a digital identity on all the people of the globe which will serve as the basis for the implementation of the Chips, basically the antechamber of the biblical mark of the beast. I had always suspected that they would have created an ad-hoc means (this virus) to impose their agenda.”

Another person, T., quotes the Bible to demonstrate that the new world order project is already taking place:

“Book of Revelation 13:17 No one could buy or sell if they did not bear the mark. If I combine ‘the tattoo is made of microscopic semiconductor crystals, and informs the [electronic] reader...’ to the successive widespread diffusion of 5G antennas, I shudder. They will even know how many times we go to the toilet during the day[...].”

Evidently, T. is convinced that the “tattoo vaccine” elaborated by the University of Pittsburgh had already been forecasted in the Bible, written two thousand years before. Considering that according to the article no one has access to an income unless he/she receives the plaster-like vaccine, T. links the statements of the Bible to this theory - everyone has to bear the mark in order to live a relatively free life (in any case controlled by the “great powers”). Bill Gates is apparently the linkage among several conspiracy theories. He is considered one of the few men that are attempting at transforming the whole world population into an army of slaves. A. published this comment:

“[...]The 100 billion euros he [Bill Gates] owns certainly make him unpunishable whatever he does, [...] he is capable of infecting people with specifically-developed viruses that he himself manages, as well as capable of proposing anti-human laws”.

Accordingly, the richest people in the world would be the only ones who are free to do anything, whether legal or illegal, as they are unpunishable thanks to their position. They would also be responsible for the alleged invention of certain viruses (including thus COVID-19) that aim at infecting people, although the commentator does not include the proofs that can argue in favour of her accusations, and Gates himself would even own the power of proposing laws - although he is not a member of the Parliament - that act “against humanity”. A. does not specify which laws Gates allegedly proposed, or even to whom or what institutions, how they would be implemented and what is the “anti-human” element. The majority of the comments published in the article’s thread follow a similar pattern of vague accusations aimed either at specific personalities or at an undefined “them”.

b) No-vax and no-mask

Between the groups described in point a) and those that will be described here there is not a strict division, the boundaries are blurred and they tendentially support each other. In fact, we have seen in the YouTube video of Barbascura X that demonstrations gather together the most varied kinds of people, including those individuals who think that the virus does not exist, combined with others who do believe in its existence, but are convinced that the number of victims is distorted. These protests attract conspiracy theorists who might admit the virus exists, but they claim that it was spread for the most bizarre motivations. Among them it is possible to find individuals who refuse the idea and the possibility of a vaccine and to wear a face mask to protect themselves and the others.

Firstly, a brief consideration is needed. There is neither a single kind of face mask nor a single kind of COVID-19 vaccine. As for face masks, there is the classical chirurgical mask, recommended for everyday activities such as working, shopping etc. It is not reusable. The second kind is the FFP2 mask, which boasts a high filtering power. It is recommended for health care workers and is reusable. Lastly, the market made

washable cloth masks available. There are two types: masks that were produced with normal fabric, which does not guarantee any protection from viruses. The second type, more recommendable, are cloth masks that require the insertion of a certified filter.¹⁶³ On the other hand, according to the WHO to January 21st 2021 there were a total of 236 vaccines that were still in the course of development. So far only two vaccines have been approved in Europe, both based on mRNA technology. The first one is produced by the company *BioNTech/Pfizer*, while the second one is produced by *Moderna*.¹⁶⁴

The fears that afflict no-mask people concern illnesses. Fake news that spread around the internet mention the risk of having a stroke or even getting cancer. On September 12th, 2020 the Facebook user Adamo shared a post¹⁶⁵ where he claimed that a professional, Doctor Montanari, stated¹⁶⁶ that the face mask makes people sick. In fact, it would prevent exhaled air to disperse and CO₂ would be trapped between the mask and the individual's mouth. This would lead to hypercapnia (too much CO₂ in the blood) that can also be accompanied by acidosis (lower pH of the blood), leading to cancer. Alice Ravizza, biomedical engineer of the *Politecnico* of Turin, explains why these statements are imprecise. Certified surgical masks allow the passage of air avoiding respiratory efforts and are all guaranteed to avoid hypercapnia; thus they are risk-free. To enforce this fact, a group of nurses measured the level of oxygen before and after a 12-hours work shift and they did not register any dangerous change or difference (Rebmann, Carrico, & Wang, 2013). A widely spread example used to prove the mask is dangerous is the case that took place in China in May 2020. Accordingly, two Chinese students died after they wore a face mask during gym class. However, the fact itself is not enough to demonstrate an alleged dangerousness. Firstly, there is no data available

¹⁶³ <https://www.hsr.it/news/2020/novembre/mascherine-covid-ffp2-chirurgiche-lavabili>

¹⁶⁴ <https://www.epicentro.iss.it/vaccini/covid-19>

¹⁶⁵ The post is available at: <https://www.facebook.com/AdamoVenezia/posts/10158007330342885> - unfortunately, the user might have restricted his privacy policy or removed it. However, the screenshot of the post is available at the article source at the following link: <https://www.open.online/2020/09/26/coronavirus-usando-le-mascherine-rischiate-linfarto-e-il-cancro-i-nomask-ci-riprovano-torniamo-a-spiegarlo/>

¹⁶⁶ Because of his potentially hazardous positions and declarations, which may deceive the citizens, Montanari was sued by the scientists of *Patto Trasversale per la Scienza*. The information related to the fact are available in their website: <https://www.pattoperlascienza.it/2020/03/25/coronavirus-abbiamo-denunciato-stefano-montanari/>

concerning alleged previous pathologies that might have affected the two students. In addition, the mask used was the N95 that is not indicated to be used during sport activity, as it does not have a good capacity to let the air flow. One of the students had to run 1000 m and did not have an autopsy performed on his body. Therefore, it was not possible to establish whether the death was connected to his face mask or not.¹⁶⁷

“One of the latest trends [...] is to include the most absurd and gruesome things among the ingredients of vaccines. Which can only be creepy if we are ignorant on the subject. As a doctor, I assure you, I could make anything very creepy[...] But I don't do it because when something "normal" turns creepy, it is obvious that there is a purpose other than information”.¹⁶⁸

Anti-vaxxers base their arguments on several points. The first one concerns a moral question, namely the use of aborted fetuses' cells to develop the anti-COVID-19 vaccine. The matter was raised first of all by the Vatican, as the *Congregation for the Doctrine of the Faith* released on 21st December 2020 a document titled *Note on the morality of using some anti-Covid-19 vaccines*. Essentially, to produce some vaccines scientists employed the foetal tissue of abortions occurred last century, from which they drew cell lines. The polemic against this practice is not new for the Vatican, as previously another essay was published on the same matter in 2005. The document states that guaranteeing the production of vaccines that are ethically acceptable is “a moral imperative for the pharmaceutical industry, governments and international

¹⁶⁷ <https://www.open.online/2020/05/27/coronavirus-la-propaganda-contro-le-mascherine-parlando-di-cancro-e-giovani-morti-in-cina/>

¹⁶⁸ Original quote: “Una delle ultime mode [...] è quella di inserire, tra gli ingredienti dei vaccini, le cose più assurde e raccapriccianti. Che possono essere raccapriccianti solo se siamo ignoranti sul tema. Da medico, vi assicuro, potrei rendere molto raccapricciante qualsiasi cosa [...]. Ma non lo faccio perché quando si trasforma in raccapricciante qualcosa di "normale", è ovvio che vi è uno scopo diverso dall'informazione”. (From: <http://www.medbunker.it/2017/02/i-vaccini-inquinati-unesperta-dice-di-no.html>). The author is doctor Salvo di Grazia, an Italian surgeon and gynecologist.

organizations”. The paper, however, approves its employment but specifies that it should not be interpreted as a legitimization for abortion¹⁶⁹.

The problem related to this moral question stems from a distorted interpretation¹⁷⁰ of the entire issue that, effectively, involved the use of cells from abortions. The Italian association of FNOMCeO, *Federazione Nazionale degli Ordini dei Medici Chirurghi e Odontoiatri* (Eng.: “National Federation of Orders of Surgeons and Dentists”) manages a website - www.dottoremaeveroche.it - that aims at the divulgation of accessible information for the population and support the professionals. A section is dedicated to the question “Do vaccines contain human foetal cells?”. The article explains that in order to survive, viruses need cells. Some viruses can be cultivated in chickens’ eggs, however some - for instance the one that causes rubella - exclusively infect humans, hence they can only survive in human cells. The necessity to employ embryonic cells for the cultivation of vaccines stems from their ability to reproduce themselves quickly and endlessly, as they boast the ability to produce all the tissue of the body. The embryonic cells used for the vaccines derive from a long generation of cell reproduction that dates back to tissues donated by two women in 1972 and 1985¹⁷¹. Hence, the assumption that foetuses are being used in the development of vaccines is a “half-truth” - doctors do not inject human material that comes from abortions, they simply employ line of cells which origin dates back to foetal tissue of around forty and fifty years ago. Other interpretations of the matter are imprecise¹⁷².

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http://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_con_cfaith_doc_20201221_nota-vaccini-anticovid_en.html

¹⁷⁰ On December 2nd 2020 the magazine *Panorama* published an alarmist article with the title *Se dietro il Vaccino (anche del Covid) ci sono i feti*, available online at: <https://www.panorama.it/news/salute/dietro-vaccino-covid-feti>

¹⁷¹ Human embryonic kidney 293 cells (HEK 293 cells) consist of a cell line that stem from embryonic cells that were grown in a culture of aborted female foetuses’ tissue. They are commonly used in cancer research and for transfection experiments. The scientist who cultured the cell lines is the Dutch molecular biologist and virologist Alex Van Der Eb (born 1934), who performed it in the early 1970s in his laboratory at the university of Leiden, Holland (from: <https://www.hek293.com/>).

¹⁷² <https://dottoremaeveroche.it/i-vaccini-contengono-cellule-fetali-umane/>

The moral question is not the only issue that triggers the refusal of vaccine practice by anti-vaxxers. They are especially scared of negative consequences, for instance getting sick, as they are afraid they might contain hazardous substances. The first assumption is that vaccines cause autism. This entire speculation dates back to a specific event that involved the British former physician and academic Andrew Wakefield (born 1957), who in 1998 published a false study on the correlation between MMR vaccine (measles, mumps, rubella) and autism (and intestine problems), involving twelve children in his study. In an article published in 2004 the event resurfaced as Wakefield was accused of conflict of interests. The journalist Brian Deer was able to prove, by a thorough investigation, that Wakefield had altered a large number of facts in order to support his own claims. The reason underlying this fraud was a lawsuit against manufacturers of the MMR vaccine. An UK lawyer recruited some of the parents of the children involved in Wakefield's study in order to prepare the lawsuit (Deer, 2004). Epidemiological studies were able to prove that there was no link between autism and MMR vaccine¹⁷³, nevertheless - in contrast to what the other ten co-authors of the fraudulent paper did - Wakefield always refused to replicate his findings or admit that he was mistaken thus he was struck off the medical register (Godlee, Smith, & Marcovitch, 2011).

A second reason why anti-vaxxers refute the vaccine is based on the conviction that at least one kind of vaccine - produced by *Moderna* - would cause a homologous recombination. Sara Cunial's intervention at the Parliament accuses the government to "use the Italians as guinea pigs, sacrificed at the altar of a clutch of lobbies, which are backed by a sell-out science and a group of corrupted and colluded politicians [...]"¹⁷⁴. The same concern was expressed by *Byoblu* (a "video-blog" by Claudio Messori, musician and communication adviser for *Movimento 5 Stelle* party). Accordingly, the problem would relate to a single molecule of mRNA contained in the vaccine that would be able to re-programme our immune system. Moreover, one would also employ GMOs that, due to their very nature, are unsafe for the human organism. Actually, first of all to

¹⁷³ There are at least 107 studies that disprove the connection vaccines-autism. A list is available at the following link: <http://justthevax.blogspot.com/2014/03/75-studies-that-show-no-link-between.html>

¹⁷⁴ <https://www.youtube.com/watch?v=iWripDBcsm8>

this day Europe - including Italy - regularly consumes products that were modified genetically. Their artificial modification aims at a series of advantages, for instance the resistance to parasites and a higher productivity¹⁷⁵. This methodology is still in its experimentation phase, however no country in the world is allowing genetic editing on human beings. Contrary to what was stated by Cunial, the *Istituto Superiore di Sanità* confirms that the mRNA molecule does not lead to any kind of immune system reprogramming. While it does not introduce the actual Covid virus into the human body cells, it only injects the genetic information that the cell needs to build copies of the Spike protein. The mRNA section does not remain in the body, as it degrades shortly after vaccination¹⁷⁶. In conclusion, the allegations made by Cunial and *ByoBlu* have no reliable basis.¹⁷⁷

A third assumption concerning the rejection of vaccines is that they contain heavy metals, including aluminium, cadmium and mercury. One of the major Italian supporters of this theory is Antonietta Gatti, who is also the wife of Stefano Montanari (the aforementioned doctor that claims that face masks make people sick). The website of the Italian Health Ministry published a fact check list in which it is clearly denied that vaccines contain these kinds of substances, or at least not in a dangerous quantity. As for mercury, the webpage states that for several years none of the vaccines commercialized in Europe have contained mercury derivatives. The dangerous nature of the amounts contained in the vaccines was, however, never demonstrated. As for other substances - e.g. formaldehyde and aluminium - they are present in a quantity so minimal that it does not cause any harm to health¹⁷⁸. The aluminium salts, in particular, are used in some vaccines for a specific scope, i.e. to enhance the immune response, essentially to “keep” the antigens in the injection point in order to attract the cells of

¹⁷⁵ <https://www.europarl.europa.eu/news/it/headlines/society/20151013STO97392/ogm-tutto-quello-che-c-e-da-sapere>

¹⁷⁶ <https://www.epicentro.iss.it/vaccini/covid-19-vaccino-moderna>

¹⁷⁷ The AIFA, *Agenzia Italiana del Farmaco*, dedicated a FAQs section regarding mRNA vaccines in its webpage: <https://www.aifa.gov.it/domande-e-risposte-su-vaccini-mrna>

¹⁷⁸

http://www.salute.gov.it/portale/news/p3_2_1_1_1.jsp?lingua=italiano&menu=notizie&p=dalministero&id=3010

the immune system. The aluminium does not produce long-term effects except for a temporary redness, swelling and pain of the skin. Our body will successively get rid of it, just like it happens with aluminium contained in some foods.¹⁷⁹

Social networks are huge platforms of aggregation not only for negationists and plotters but also for supporters of no-vax and no-mask movements. Although many get banned regularly, Facebook groups that produce fake news and spread negationist and conspiracy theories keep resurfacing. Sara Cunial's Facebook page boasts 170.000 followers¹⁸⁰ and her profile is regularly updated with tendentially alarmist news. Her post from August 18th 2020¹⁸¹ reports the links of the four parliamentary questions that she issued to the health minister Roberto Speranza. She then proceeds to sum up the problem related to them, namely the so-called GMO vaccines. By reporting declarations from a couple of experts, she attempts to prove that the vaccines approved by the European Union are dangerous and possess the ability to genetically modify human bodies. The post counts around 1.100 comments and 5.100 shares. Many commentators seem to be supportive of her work - "Well spoken!"; "Keep it up!"; "Thank you Sara!". Once again, religion is brought up: the user G. claims: "No to vaccine, it's better to die in the grace of God and not succumb to their purpose by losing our identity.[...]" Another person seemingly refers to the conspiracy theory of the new world order: "The only hope is an international coordination to stop this madness. By oneself, one can't stop this huge machine that has been planned for some time." Other two users are convinced that this vaccine is the first step towards the annihilation of human civilization, thanks to the alleged health dictatorship. R. talks of a "genetic selection", whereas M. writes:

"No to mandatory vaccines, I am not standing with the health dictatorship, we must fight against this abuse otherwise for us it will be the degradation of human civilization[...], so let's defend ourselves from this dictatorship, [...]let's rebel otherwise in the near future our civilization will be exterminated!"

¹⁷⁹ <https://www.infovac.ch/it/faq/alluminio-nei-vaccini>

¹⁸⁰ Updated to 25/01/2021

¹⁸¹ Available at: <https://www.facebook.com/saracunial.camera/posts/4-interrogazioni-al-ministro-speranza-sui-vaccini-anti-covidin-queste-settimane-583222885689266/>

It is clear to which extent disinformation can influence these people. They rely on who we can call a “charismatic leader” - someone who is able to obtain a large consent thanks to their communication abilities, which are often not connected to their actual competences. These influencers contributed to create a strict division between two groups of people: those who consider COVID-19 a health emergency and those who see it as a democracy emergency. The latter includes those individuals that have been described so far.

Fake news aims at triggering immediate emotions, e.g. anxiety, anger, scorn and frustration. In an online article published on May 21st 2020¹⁸² the author collected the screenshots of some comments published by no-mask people and no-vaxxers on Facebook, and it is possible to observe the direct impact of fake news on these individuals’ emotions. The comments are mostly threats towards paediatricians, considered partners with “big pharmas” and accused to be part of a sort of a secret and international agreement to inject harmful substances (i.e. vaccines) into people’s bodies, causing harm especially in the children. Some users curse the doctors, others confide that god will punish them. The users who are against mandatory face masks claim that they should not be worn especially by children, as it makes them sick and children must be protected. The user L. states: “Wearing Batman’s mask can be a game, and only for a brief time... BUT IT CAN NEVER BE A GAME TO WEAR A MASK THAT HINDERS PROPER BREATHING ESPECIALLY IN CHILDREN! YOU MUST BE ASHAMED!”.

c) Scapegoating and racism

A point worthy of consideration is the accusation concerning the responsibility for COVID-19. The large number of conspiracy theories gave rise to an additional one, that is mostly linked to a conception of scapegoating. In fact, if on one hand there are heated discussions about how the virus is being exploited, on the other hand some subjects instil the doubt that COVID-19 might have its origin in a laboratory. Scapegoating led to

¹⁸² <https://www.open.online/2020/05/21/sono-tornati-no-vax-ora-anche-no-mascherina-insulti-diffamazioni-e-minacce-ai-pediatri/>

behaviour of intolerance and racism in everyday life towards Chinese people everywhere including the most democratic countries.

A far-right newspaper with its headquarters in New York, called *The Epoch Times*, is remarkable for its strong opposition to the Chinese Communist Party, to the point that in April 2020 it unsolicitedly distributed copies where it was claimed that the Coronavirus was released from a Wuhan laboratory with the aim of being used as a bioweapon. In addition, the same company published a video on Facebook with similar claims, that was viewed by around 70 million people before Facebook flagged it (Bellemare, Ho, & Nicholson, 2020). The former President of the United States Donald Trump supported this theory, backed by the Secretary of State and a Senator. Trump spoke up during the 75th annual U.N. General Assembly (held on the 22nd of September, 2020), underlining that China released wrong or, as Trump asserted, false declarations as regards to the seriousness of COVID-19 (Herman, 2020). Moreover, according to *The Economist*, an international newspaper with its headquarters in England, in China there are conspiracy theories that mirror the above-mentioned ones, as accordingly the virus was created in the US by the CIA to weaken China.¹⁸³ In March the spokesman of the Chinese Ministry of Foreign Affairs claimed that SARS-CoV-2 was brought to China by the US army, in an effort to weaken the communist government (Myers, 2020). Similarly, according to US officials, a large number of Russian social media accounts carried out a misinformation campaign against the US, claiming that Trump's America was responsible for Covid outbreak (Glenza, 2020). In Europe, a study conducted by the department of microbiology of Innsbruck University stated that the laboratory origin "can't be excluded" due to the adaptability of the virus to human and animal cells (Segreto & Deigin, 2020).

Scientists repeatedly remarked that COVID-19 has a natural origin, specifically in a bat. First of all, it was explained why Coronavirus could not have "escaped" from a lab. Essentially, laboratories that study bacteria and viruses follow the BSL (Biosafety Level) standards, a system of safety measures that consist of four levels from BSL-1 to BSL-4.

¹⁸³ <https://www.economist.com/china/2020/02/08/chinas-rulers-see-the-coronavirus-as-a-chance-to-tighten-their-grip>

The first one embraces the study of those pathogens that are well known and that do not represent a threat. The second one includes microbes that pose a moderate threat, they include indigenous ones e.g. *Staphylococcus aureus*. The third level comprises the study of either indigenous or exotic viruses that can at times be lethal to human beings - for example the bacteria that causes tuberculosis. Lastly, the fourth level counts a limited number of labs around the world and allows the study of exotic aerosol-transmitted microbes, for example the one that causes Ebola.¹⁸⁴ Thus the very strict measures and containment levels, combined with the very limited number of BSL-4 labs would not allow the escaping of very dangerous viruses. Although, naturally, accidents can still happen, they would be recorded and documented and, most likely, it would not be possible to brush them off or hide them.

Many papers were published in order to disclaim the theory of laboratory origin. For instance, in March and August 2020 two important studies were issued. The first one, *The proximal origin of SARS-CoV-2*¹⁸⁵, published in March, demonstrates from the biological point of view that the virus was not produced in a laboratory or artificially manipulated. The authors are scientists of important universities including Columbia University, the University of Edinburgh and the University of Sydney. The second one, published in August in the *International Journal of Biochemistry & Physiology*, discusses the origins of SARS-CoV-2, its transmission and the routes to track down the origin of a virus. In particular, this paper reports a series of questions to ask oneself in order to investigate the origin of a virus. The most important question is whether the virus is nearly identical or very close to any virus found in animals or nature. If the answer is yes, then it most likely was not lab-produced (Koyunoğlu, 2020). In the case of SARS-CoV-2, a study published on *The Lancet* in January 2020 confirms that COVID-19 virus has a natural origin:

“Notably, 2019-nCoV was closely related (with 88% identity) to two bat-derived severe acute respiratory syndrome (SARS)-like coronaviruses, bat-SL-CoVZC45 and bat-

¹⁸⁴ <https://www.cdc.gov/training/quicklearns/biosafety/>

¹⁸⁵ Available at: <https://www.nature.com/articles/s41591-020-0820-9>

SL-CoVZXC21, collected in 2018 in Zhoushan, eastern China, but were more distant from SARS-CoV (about 79%) and MERS-CoV (about 50%)” (Lu, et al., 2020).

A social problem generated after the increasing numbers of COVID-19 cases is the rampant racism. China, being the ground zero for COVID-19, found itself in an awkward position, which consequences especially reflected on its citizens - or even on anyone who bore typical Chinese facial features. Racism episodes consist of jokes, comments behind the victim’s back, and at times straightforward insults and offenses and violence. Victim blaming spread not only among the population or uncultured people, but also among politicians and various users of social networks (which can actually include anyone). For example, Trump defined Covid the “Chinese virus”, while on Twitter puns appeared - e.g. Chop *Fluey*, Mao Tse *Lung*, *Toflu*, Kung *Flu*. New and old stereotypes arose, including the one that considers Chinese cuisine dirty, the conviction that Chinese’s daily diet is based on pets (cats and dogs). To these prejudices a new one was added, namely the stereotype of Chinese people as “bat eaters” (Cadalano, 2020).

Episodes of racism took place indiscriminately in many countries: from Italy and European countries in general to the US, from Egypt to Iran and Thailand. These discriminations not only targeted adults, but also children. The newspaper *La Stampa* reports some of the many cases that took place during the first months of the Covid breakout. An article by *La Stampa* lists a number of episodes that took place in Italy. For instance, in Milan a 13 year-old football player was told “I hope you get the virus just like [it happens] in China” by an opponent, while in Florence a video shows two Chinese tourists who were called names by a man who allegedly lived in that area. Some significant episodes of intolerance took place in Venice, where a group of young people spat on a couple of Chinese tourists, and in Bologna, where the city mayor reported that a 11-year-old Chinese boy was bullied because of his origins. At the same time, from an economic point of view, Chinese business underwent difficult phases, as many

customers preferred to avoid their restaurants and shops due to their fear of contagion. Similar episodes targeted Chinese people in other countries, both rich and poorer¹⁸⁶.

These racist episodes are seemingly limited. Essentially, contrary to what happened with epidemics in the past (see e.g. syphilis), governments mostly recognised and condemned them. Almost no scientific articles or private subjects seem to directly move accusations towards Chinese population itself. However, although those private subjects - e.g. the examples mentioned above - are usually linked to prejudice, ignorance and fear, public subjects - namely some politicians - exploit the so-called “Chinese virus” to score political points. A user of *La Stampa* comments:

[...] Today in Italy having almond-shaped eyes has become a horrendous fault. Insults and threats are a daily occurrence. The sad thing is that no one intervenes, indeed in many cases they [the perpetrators] also receive compliments from bystanders. We have reached the point that the fascists put posters in the windows to invite consumers not to enter their businesses. The bar in Rome in the most beautiful square of the capital displayed a sign forbidding Chinese tourists from entering. We have now touched the bottom of the barrel.¹⁸⁷

It is possible to find evidence of intolerance by political men in the social networks, by reading certain posts published by some extremist politicians - some of them are also part of the Parliament. They aim at gaining consensus by triggering indignation and anger in the reader. For instance, on July 2020 a far-right extremist published the following Tweet:

China, voluntarily or not, has infected half of the world. After allowing the virus, with its lies, to circulate, it is the only economy that will grow. [China] is ready to come to Italy to buy businesses and companies. We asked the government to protect our assets.¹⁸⁸

¹⁸⁶ <https://www.lastampa.it/cronaca/2020/02/02/news/coronavirus-da-casapound-ai-campi-di-calcio-il-razzismo-e-di-casa-in-italia-1.38415778>

¹⁸⁷ *ibidem*

¹⁸⁸ <https://twitter.com/matteosalvinimi/status/1278770751944957954>

The same politician published the following post on Facebook on January 2021:

They [are] in the square to celebrate, [whereas] we are forced to new limitations to our freedom. Insult on top of injury. The president of the Communist Republic of China has in fact cheered and said that 2020 was an "extraordinary year, an epic", in Wuhan everyone [is] free and [is having] big celebrations, in Italy and in the rest of the world [we are] stuck at home and destined for further closures, limitations and serious economic and social damage. Time will bring truth, we certainly will not forget their lies.¹⁸⁹

These two posts show an example of what we have previously called politician-influencer. It is possible to deduce that he starts off by creating two sides: there is a "us" and a "them". China is part of the opposing faction and is displayed as a liar that due to its action is going to first ruin and then take over "us". The author specifies that it might not have been a voluntary action, nevertheless the final outcome allegedly favours China, that will exploit our weakened economy to absorb our businesses in its own economy. China's asset is "ready to come" like an army that planned an attack for a long time. In the second post the politician remarks the different situation between "us" and "them", an attempt to arouse negative emotions in the reader, who feels that it was committed an injustice and he/she is a victim of the other. *They* are happy, free and are celebrating - implicitly meaning that people are free to gather together - whereas Italians have to stay locked up into their homes and are not allowed to meet anyone, much less celebrate, while the economy and society is being damaged. The post finishes with an almost biblical claim: actions will not be forgotten, justice and truth will come for them. In this way, the target audience will feel oppressed and angry, and the politician-influencer seems to be the only person who understands them, since he describes their emotions so accurately.

As also Riva (2018) underlines, a characteristic of the group of people who follow this kind of leader is the lack of individual initiative to fact-check what is being claimed and to understand to what extent the truth or facts reported was magnified. China has

¹⁸⁹ <https://www.facebook.com/salviniofficial/posts/loro-in-piazza-a-festeggiare-noi-costretti-a-nuove-limitazioni-della-nostra-libe/10158331590468155/>

actually released information regarding a new virus possibly later than it could have, however, after their lockdown, China collaborated and offered support and medical help to European countries. When COVID-19 arrived for the first time in Europe, it was still unknown and scientific research did not even have the scientific evidence of the speed of virus spread. Individual governments had the freedom to take the decision regarding the activation of lockdowns. Italy was the first one who took the initiative in March, although the virus had already reached Europe almost two months earlier. Therefore, the responsibility for the length of lockdown time and the application of the safety measures relies on each European national government. A pandemic has undoubtedly a region of origin, however its course is a responsibility that falls onto the single countries, and the efforts and sources should be aimed entirely at the extirpation of the epidemic.

CONCLUSION

My dissertation revolves around an assumption: epidemics cause crises and they are the factors that trigger changes, encouraging states to explore ways to cope with health emergencies and innovate their system. They gave a decisive contribution to the history of humanity and deserve much more space. I have built my reasoning around three issues: how did the vision on epidemics - and the epidemics themselves - change along the history of Europe and thanks to whom/what? In which ways Europe and European states managed the struggle against ailments before and after the discovery of the mechanisms of diseases transmission? How did the population's reactions to measures and epidemics evolve? Firstly I have analyzed, in chapter 1, the background information and basic concepts, including an excursus of epidemiologic demography and its relation with population growth. In chapter 2 I have analyzed epidemics in the past, the changes they brought about in the society and the reaction of people before (with plague) and after (with smallpox, cholera, syphilis) the discovery of germs. Lastly, in chapter 3 I focused on the measures and reactions to the current epidemic of COVID-19, highlighting the role of the media.

I have ascertained that epidemics emerged when people became sedentary. Thereby, a fertile ground for illnesses was created thanks to higher population density, the closeness to animals and water storing. As such, epidemics could manifest themselves in occasional outbreaks that were, initially, circumscribed to certain areas and regions. The two factors that determined the shift from epidemics to pandemics were the transfer of groups of people from a place to another, triggered by industrial and agricultural revolutions, and the great geographical discoveries. In this way not only culture and goods but also ailments were transferred from one place to the other. Oceans became bridges, and people (as well as animals and plants) the vectors of new epidemics. In many cases, this transfer had devastating consequences, like in the case of Native American population.

It might have been possible to avoid a number of consequences, had scientific research been fairly developed at that time, but unfortunately, epidemics had been a mystery for a very long time. The period from Ancient Greece up until the 18th century

was characterized by the same approach to illnesses, led by a great ignorance on the matter. The official and approved medical knowledge was a competence possessed only by individuals who studied at the university. University formed the theoretical knowledge but did not offer a “technical” preparation. On the other hand, those who did know the anatomy of the human body and had actual “technical”/medical skills did not have the theoretical preparation. The most credit was given to the first category, who also prescribed remedies based on the “equilibrium of bodily fluids”, such as bloodletting and purges. Furthermore, it was believed that illnesses were caused either by evil or good spirits, or by a miasmatic atmosphere. Essentially, all the efforts to prevent or cure illnesses were focused in the wrong directions. These methods and assumptions could not stop the epidemic of plague that ravaged Europe in the middle ages.

Science could not give a proper contribution to contain the epidemics before the discovery of germs, nevertheless European states managed to implement the first measures that turned out to be quite effective. The Republic of Venice pioneered a great part of the measures, including maritime and land quarantine, the first rough measures of “sanitization” and social distance and the first important and efficient health authorities. Great efforts were employed in the controls and sanitization of vessels, which became a priority in the Republic of Venice. The reactions of people to plague in Europe were generated by ignorance: mostly by beliefs, religion and folklore, tied together by fear. There was no such thing as a campaign of information regarding the origin of ailments, science still groped in the dark. Plague epidemics were attributed to several factors: people’s sins, evil spirits and God’s will, which gave birth to cults and to countless episodes of violence. In fact, many individuals and groups of people were targeted and blamed, resulting in tortures and executions. In some cities of Italy, in particular Milan, the assumption that plague-spreaders (*untori*) were poisoning people was largely spread. The *untori* were usually identified among the poor, whereas in the 19th century during the cholera epidemics this phenomenon represented the distrust of the poor towards the bourgeoisie and medics.

When Pasteur discovered the germs, epidemiological science began to progress quite rapidly, although it still clashed with popular culture and religion. Empirical science

began to supply the first results, but often it could not comply with politics. In fact, although the role of the modern state grew stronger during plague epidemics, one could not easily apply measures linked to science on the population, such as mass vaccination. Influence of culture, beliefs and religion was still quite pervasive. Mass vaccination against smallpox was launched by many states, but it was only in the 20th century with WHO that an efficient and definitive campaign of vaccination was launched. Thanks to states' collaboration and people's trust in science, it was eradicated on the global level - although one fears that some states might be keeping some samples to be unpredictably exploited in warfare. Cholera, the second case-study, represents how an illness can lead to a city's (London) development and progress. Science covered a great role: finding out that cholera's origin did not lay in people's sin, spirits or miasmas but indeed in the water led to the modernization of London, that in terms of progress was a middle ground between medieval and modern Europe. Cholera has not been eradicated, but currently international organizations are managing international campaigns to remove and prevent it. Lastly, syphilis represents how an illness might have contributed to change the future of the countries thanks to its "invisible" effects. This illness could lead to madness, and could have affected the mind of great leaders, turning them into violent and ruthless men, characteristics reflected in their decisions and actions in their political (but also married) life. Syphilis, just like the previous ailments, is being managed nowadays thanks to international efforts, aimed at the reduction of stillbirths (of which syphilis is the second leading cause).

As for people's reactions after the discovery of germs, the greatest obstacle was the mentality; Its change was a slow process. Reactions to epidemics were still rooted in certain fears, reaffirming scapegoating and adding new elements: racism and discrimination. On the other hand, science had entered political programs, but it took a long time before people were able to trust it. The first "organized opposition" to the government's role in health matters were born in this period, namely the 18th-19th century: no-vax movements. Scapegoating and blame-giving moved their focus to the structures of the society. I have analyzed the case of cholera: this infection mainly stuck the poor, who blamed the outbreaks on the rich as they assumed they were trying to poison them. On the other hand, the rich turned the fault onto the poor, arguing that

they attracted cholera epidemics on themselves due to their lifestyle. Science was targeted as well, as physicians could not gain people's trust. The fear of *untori* struck some European countries, leading to numerous episodes of violence. It can be translated into the diffidence of people toward authorities.

The idea that certain groups of people "attracted" the illnesses on themselves could also be observed in the case of syphilis epidemics in Africa. Christian missionaries attributed the origin of syphilis on the very essence of African culture, which they defined too underdeveloped: according to European missionaries, African tribes were not civilized enough, and the only way to "fix" them was the complete eradication of their culture and habits, replacing them with the alleged more advanced occidental model and culture. Thus, these Christian missions featured an element of racism. Lastly, the fear induced by religion and distrust in science generated the first "no-vax" movements. Religion interfered with vaccination for two reasons. Firstly, it was immoral to try and interfere with god's will (i.e. epidemics to punish sinners), and secondly it was unnatural and dangerous to inject in the human bodies "animal parts" (i.e. inoculation). A second motivation that fuelled no-vax movements was that vaccines - especially the ones destined to less affluent classes - were thought to be of bad quality, and the more the state attempted to make inoculation mandatory, the more the population refused to compel.

In chapter 3 I have investigated COVID-19's measures and reactions. They locate themselves in the post-germ theory spectrum. We could observe whether a difference of three centuries has had a change in the general mentality of the population, and it is also an example of international coordination and collaboration to cope with an epidemic. Epidemics cannot be stopped by country borders, and a correct response can be supplied by acting as a single subject, encompassing everyone's needs and difficulties and managing them all together equally. EU's responses proved that a correct collective response is characterized by the preoccupation of the citizens, a continuous dialogue between the government and the citizens, and the investments of large funds both for the research and for the support of SMEs, so that the impact on the economy can be "softened". These three actions were translated into civil protection, the creation of the

collective fund *RescEU*, the large number of funded scientific projects to find a vaccine for COVID-19, and the aid and incentives for SMEs.

In Italy, the response to COVID-19 is a debated question. Due to the nature of the emergency, an immediate response was necessary. The strategy relied on the emanation of a series of DPCM, that for the first wave excluded the intervention and collaboration of the Parliament, the Ministers and the opposition. A massive campaign of information on COVID-19 involved the most authoritative organs. The lockdown and the limitation of circulation freedom stressed the potential of the internet and the social network platforms. Both national and international organizations worked to provide constant and updated information about Covid, also to contrast fake news. On the whole, the Italian response provided was quick and mostly efficient, although one could argue that the political response came relatively late.

As for people's reactions to COVID-19 and the measures, compared to the past they evolved hand in hand with the new virtual instrument, i.e. internet. This crisis has generated a virtual battle between the spread of information and the struggle to contrast and disprove them. Fear combined with misinformation gave space to forms of negationism, conspiracy theories and affirmed the role of no-vax and no-mask movements. These movements not only refuse to comply with government's measures, but express a more or less implicit fear to have their freedoms taken away and to have governments that embrace an endless power. In addition, they are afraid that they can be turned into slaves or, in the worst of the case, be involved in a mass-murder planned by higher authorities. These theories are fueled by the fear spread on social networks through posts and multimedia contents. Also scapegoating and discrimination emerged too, that in this case are not fed by Christian missionaries but by politicians themselves. Some politicians have, in fact, taken the role of influencers. Unfortunately, they exploit their own influence to spread fake news and imprecise information, strengthening the antagonism of parts of the populations towards the government and science. This can be seen as an evolution of the plague-spreaders and cholera-spreaders of the past.

The world and the course of history was largely influenced by epidemics, that due to their importance should be analyzed separately, like the engine and promoter of

many historical changes in the society. Epidemics pushed progress and when they stopped being a mystery, society's life expectations began to rise. They have been the promoter not only in the progress and development from a state structural point of view, but also in terms of culture and mentality. Science marked the passage point from beliefs to empirical truth, from hypotheses to certainties and from fear to hope. I have demonstrated that, despite many positive changes especially in the field of political decisions and international collaboration, from the point of view of people's reaction there is still a long way to go.

In my dissertation I have verified that the contemporary mentality is still linked to the search for and identification of presumed *untori*, essentially individuals to whom we can entirely attribute the blame and responsibility for - in the specific case of my thesis - the outbreak of epidemics and pandemics. This persistence reveals a society that looks for not only a relief valve, but also certainties. Namely, the certainty that determined harmful phenomena are attributable to specific individuals. In this way, a starting point is identified - the responsible can be punished, and once they are stopped, they can no longer harm society and consequently not spread epidemics. It seems that the virtual reality of the internet is taking wrong turns and driving a wedge between governments and science versus the population, especially due to the spread of misinformation and fake news and the action of politician-influencers. However, official institutions and organizations are relentlessly fighting these phenomena and campaigns of information take place through pretty much every media: TV, radio, internet. The hardest work to do is on the dialogue between government and population. Campaigns of information should not only supply neutral factual evidence, but also work on the fears of the population, that are the ones that trigger bizarre reactions, that at times can become violent, harmful or discriminatory.

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- European Council; Council of the European Union: <https://www.consilium.europa.eu/>

European Commission: <https://ec.europa.eu/>

YouTube: <https://www.youtube.com/>

Twitter: <https://twitter.com/>

Istituto Superiore di Sanità: <https://www.iss.it/>

INAIL: Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro:
<https://www.inail.it/cs/internet/home.html>

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