The *Lancet* Commission on medicine, Nazism, and the Holocaust: historical evidence, implications for today, teaching for tomorrow

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Executive Summary

The Holocaust, the systematic, state-sponsored persecution and murder of 6 million Jews by the National Socialist (Nazi) regime and its collaborators, is arguably the most extreme instance of crimes against humanity and genocide in history. During its reign of terror, the Nazi regime committed innumerable acts of violence against Jews, Sinti and Roma, people with disabilities or psychiatric illnesses, political prisoners, prisoners of war, and others. A distinctive and disturbing feature of these atrocities is the important role that health professionals played in formulating, supporting, and implementing inhumane and often genocidal policies. After World War 2, these crimes were important factors that contributed to the establishment of contemporary health professional ethics. Learning about, and reflecting upon, this history can have various benefits for learners and practitioners of health sciences, and the patients and communities they serve. Health sciences curriculums, however, rarely cover this topic. This is why Richard Horton, *The Lancet*'s Editor-in-Chief, convened the *Lancet* Commission on Medicine, Nazism, and the Holocaust.

Nearly 80 years after the defeat of Nazi Germany and the end of World War 2, references to Nazi medical crimes remain common—the surge of Nazi tropes deployed in anti-vaccination propaganda during the COVID-19 pandemic provides striking examples. All too often, such references are based on fragmentary knowledge of the facts, simplified assumptions, and serious misconceptions. This Commission aims to provide a reliable, up-to-date compendium of medicine's and medical professionals' roles in the development and implementation of the Nazi regime's antisemitic, racist, and eugenic agenda, which culminated in a series of atrocities and, ultimately, the Holocaust. On this basis, we posit implications for the medical field and for society more broadly, and outline a roadmap for integration of this history into health sciences curriculums worldwide.

Medical crimes committed in the Nazi era are the best-documented historical example of medical involvement in transgressions against vulnerable individuals and groups. What happened under the Nazi regime has far-ranging implications for the health professions today, and virtually every debate about health professional ethics can gain from an understanding of this shameful history—from questions regarding the beginning and the end of life, to health professionals' roles as economic actors or as agents of the state. This history shows the potential for health professionals to harm their patients, but also, when necessary, to stand up to power and protect the most vulnerable.

One of the goals of this Commission was to develop, informed by assessment of existing medical curriculums, educational approaches that promote ethical conduct, moral development, and the formation of a professional identity based on compassion through education about medicine, Nazism, and the Holocaust. As a result, we offer here a new educational paradigm, which we term history-informed professional identity formation. It integrates frameworks from health sciences education with the Commission's specific objectives for the training of health-care professionals. We also propose a concrete roadmap to implement recommended mandatory curriculums on the history of medicine, Nazism, and the Holocaust and its implications in all health sciences education. This roadmap explores pedagogical approaches, questions of curricular design, assessment, and faculty development. Importantly, beyond an informational level of learning, education centred on this history can also result in learning on the formational and transformational levels—through prompting reflection on contemporary implications, for example. The aim is to support the development of morally conscious and self-critical, yet courageous and resilient health professionals—independent thinkers who are capable of upholding professional values in the face of pressure and who will, when needed, act as agents of change.

Contemporary health professionals and societies globally have been confronted with multiple crises: the COVID-19 pandemic; a rise in overt antisemitism, anti-immigrant sentiments, and other forms of racism and discrimination; climate change; the Rohingya genocide; and wars, such as in Israel, Gaza, Syria, Ukraine, and Yemen. It is our conviction that the study of medicine, Nazism, and the Holocaust can help to prepare medical professionals to stand up against antisemitism, racism, and other forms of discrimination, and to embrace and defend our shared humanity in their professional roles and as global citizens. It is only through understanding and reflecting upon history that we can fully understand the present and shape a better future.

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Key messages

Implications

- The central insight from the history of medicine during Nazism and the Holocaust is that the atrocities that health professionals committed during the Nazi reign and the Holocaust represent, to a large degree, the outcome of corrupt moral agency in the face of potential dangers that are inherent to modern, scientific medicine as it emerged in the 19th century.
- The core values and ethics of health care are fragile and need to be protected. They require constant critical assessment and reinforcement.
- Courage, resistance, and resilience are necessary to prevent and counteract potential abuses of trust, power, and authority in health care.
- Health professional practice and the pursuit of scientific knowledge should occur within a framework that prioritises individuals' human rights.
- Health professionals have particular responsibilities in fighting against antisemitism, racism, and other forms of discrimination.

Recommendations

- *Medicine, Nazism, and the Holocaust should be a mandatory part of health sciences curriculums*: Every training programme for health professionals worldwide should include learning about the history of medical involvement in Nazism and the Holocaust. Teaching should focus on learning core facts and reflecting on the implications of this history for present and future health-care practice, including the responsibility of medical professionals and their institutions to uphold human rights within clinical practice, research, and public policy, and to combat antisemitism, racism, and other forms of discrimination. The topic should be covered both in specific courses and, when appropriate, across the curriculum. Educators are recommended to complement instruction on medicine, Nazism, and the Holocaust with related content specific to their country or community. International and national accreditation bodies should include a set of core learning outcomes and competencies related to this history and its contemporary implications within the respective accreditation requirements for health-professional training programmes.
- *Critical reflection on the connections between the historical and contemporary values and ethics of health professionals should become part of professional training:* The history of medicine, Nazism, and the Holocaust shows that values and ethics in health care are not immutable but change over time dependent on cultural, social, economic, and political factors (and particularly when placed under pressure). Therefore, values and ethics constantly need to be critically assessed and reinforced to protect them from potentially becoming exclusionary and inhumane.
- *History-informed professional identity formation should be adopted as a foundational approach in education*: History-informed professional identity formation is the shaping of professional identity through learning about, and reflecting on, historical episodes in which medical values and priorities were challenged. Medicine in the Nazi period presents learners with the most extreme and comprehensively documented example, and therefore lends itself well to this type of learning. For training programmes working with the concept of professional identity formation, the history of medicine, Nazism, and the Holocaust should be part of the implementation of this educational framework in view of the influence of this history on contemporary ethical standards, practices, and challenges. These training programmes should take into account that learning about this history can be a transformative experience.
- *An international professional association focused on medicine, Nazism, and the Holocaust should be established*: Organisations and scholars in the fields of bioethics, human rights, history, medical education, and health care should work together to establish a transdisciplinary professional association focused on research, education, and advocacy in the field of medicine, Nazism, and the Holocaust. Such an organisation could serve as a catalyst for the promotion and dissemination of studies of this history and of its contemporary and future implications, and for training future generations of educators in the field.
- *A digital library of teaching resources on medicine, Nazism, and the Holocaust and the role of health professionals in other human rights violations should be established*: To facilitate teaching of this history in health sciences training programmes worldwide, we recommend a publicly accessible multimedia, multilingual library that includes resources on historical evidence, model curriculums, and assessment tools.
- *Victims should be identified and memorialised as individuals*: Universities, psychiatric hospitals, and other medical institutions in Germany, its formerly annexed and occupied territories, and in other nations should promote the individual identification and commemoration of victims of Nazi medical crimes. Further investigations are needed to continue identifying the victims of Nazi medical crimes and to reconstruct their individual biographies to allow for proper memorialisation. Acts of remembrance in honour of the victims should be held at all of the involved institutions.
- *Medical institutions should promote research on their own history*: Medical institutions worldwide should be aware of their potential past connections to human rights violations, crimes against humanity, war crimes, and genocide, and should initiate appropriate research. Although many medical institutions, including those operating in Germany during the Nazi period, have impressive records of studying their history, many have yet to start this work.

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- *Health professionals need to implement a set of core responsibilities regarding antisemitism, other forms of racism, human rights violations, crimes against humanity, war crimes, and genocide*: Learning about medicine, Nazism, and the Holocaust could help to foster an understanding of the fundamental importance in medical contexts of the idea of universal human rights—a concept increasingly adopted into international legal regulations and codes of ethics after the devastation inflicted by Nazism. Methods of preventing, investigating and responding to human rights violations (eg, crimes against humanity, war crimes, mass atrocities, genocide) should be incorporated into the ethos of health professions and framed as a professional responsibility of advocacy and care. A competency framework for education and assessment in this domain should be formulated and implemented. National and international professional bodies should convene a multidisciplinary working group to develop an international charter on health professionals and human rights. This working group should bring together and expand previous work on supporting human rights and confronting the challenges of antisemitism and other forms of racism that health professionals face.

Introduction

The *Lancet* Commission on Medicine, Nazism, and the Holocaust is the first *Lancet* Commission to focus on the history of medicine. It was convened by Richard Horton, *The Lancet*'s Editor-in-Chief, to make the history and implications of medicine's role during the Nazi period more widely known in the medical community, and to help to introduce this subject into all health sciences education.[1–3] The Commission comprises a diverse, international group of twenty scholars—historians of medicine, medical education specialists, physicians, and bioethicists—and was supported in its work by a student advisory council with 15 members from ten countries.

By exterminating nearly six million Jews in the Holocaust and implementing murderous policies against so many other groups (including Sinti and Roma, people with disabilities or psychiatric illnesses, political prisoners, and prisoners of war), the National Socialist (Nazi) regime destroyed the self-perception of European civilisation as the pinnacle of human progress.[4] The Nazi regime leveraged the prevalent antisemitism (prejudice against or hatred of Jews)[5] in German society to wage, in the words of historian Dan Michman, an "all-encompassing battle…against the Jewish spirit [*jüdischen Geist*], which Nazism perceived as representing the unnatural notion of the equality of all human beings. This battle was waged on many fronts, including science, culture, medicine, language, law, and more."[6] Yet the idea that every human being is valuable is at the core of health professional ethics, and it is in this context that the history of medicine, Nazism, and the Holocaust acquires universal significance.

In the Nazi era, science, medicine, and public health were used to justify and implement persecutory policies and eventually state-sanctioned mass murder and genocide (the targeted murder of specific religious, racially defined, national, or ethnic groups). Studying the history of medicine during Nazism reveals the dangerous potentials of modern medicine, which coexist with medicine's immense power to benefit humanity. The significance of this history is not limited to the descendants of the victims and perpetrators and their societies: it is relevant to communities worldwide—not least because early 20th-century Germany pioneered so many aspects of modern medicine that were adopted to varying degrees in many countries.

This Commission will explain in detail a series of complex, disturbing, and important historical facts, including that many German physicians willingly joined the National Socialist German Workers' Party (ie, the Nazi Party), collaborated in the dismissal and persecution of their Jewish and politically dissident medical colleagues, and eagerly filled the resulting personnel vacancies. The victims were forced to flee or risk imprisonment and death. German health professionals also helped to prepare forced sterilisation legislation and performed these procedures on between 310 000 and 350 000 victims who were labelled genetically inferior.[7,8] During World War 2, at least 230 000 people with various mental, cognitive, and other disabilities whose lives were deemed unworthy of living were murdered in euphemistically named euthanasia programmes in Germany and the conquered territories.[9–22] The transfer of staff, including health personnel, and killing expertise from the patient murder apparatus to the extermination camps of Operation Reinhardt (the name for the plan to exterminate Jews living in German-occupied Poland) contributed to the murder of 1·7 million Jews and an unknown number of Roma and Soviet prisoners of war (overall, around 3 million Soviet prisoners of war died in German camps).[23] Tens of thousands of individuals were subjected to forced medical research, resulting in great suffering, maiming, and death.[24] Victims' bodies, in life and death, were used for research and teaching, with specimens sometimes kept for research long after World War 2.[25] Few health professionals openly refused to collaborate in any of these activities, though those who did not collaborate were rarely sanctioned. At the same time, many persecuted physicians in concentration camps and ghettos, under horrific conditions and faced with

impossible moral choices, sought to continue teaching and research and to care for their patients as best they could, doing their utmost to save lives. In the ghettos specifically, Jewish medical personnel's resistance against Nazi oppression manifested in the continued provision of medical services through what remained of the community infrastructure established in the interwar years.

Ample documentation shows that physicians and other health professionals in Nazi Germany were extensively involved in legitimising eugenics, antisemitism, racism, and other forms of discrimination, and played key roles in planning and implementing inhumane practices. Nevertheless, common misconceptions about medicine in Nazi Germany remain. Among them is the belief that Nazi medicine—despite significant evidence to the contrary—was mostly pseudoscience, and, as such, had little to do with the standards and practices of 20th-century biomedical science internationally. However, the Nazi regime in Germany and its alliance with medicine did not arise in a vacuum: German medical scientists were part of international networks exploring and promoting eugenics and developing medical rationales for racist beliefs and practices in many nations. These international networks lent an air of legitimacy to German scientists, who pushed the tenets of medical racism and eugenics to their extremes and contributed to the scientific legitimisation of the virulently antisemitic and racist policies of the Nazi regime. Furthermore, the research design of at least some of the most brutal Nazi human experiments still followed a recognisable scientific logic, albeit paired with complete disregard for the suffering of the coerced participants. The example of Nazi Germany shows that scientific logic alone cannot prevent ethical transgressions, and learning about and reflecting on this history is important for all in the health sciences.

It is also incorrect to assume that health professionals in Nazi Germany had no concept of medical ethics; in fact, we will show that Nazi Germany developed a specific form of ethics that put the health of the German people above all else, but that excluded vast numbers of individuals from being considered part of the German people according to eugenic, antisemitic, and other racist criteria. Thus, medical ethics became another instrument to help design, rationalise, and implement the regime's eugenic and racist agenda.

Perhaps the most pernicious fallacy about medical involvement in Nazism and the Holocaust is the notion that medical atrocities were the acts of individual, radicalised physicians (ie, a few bad apples). The historical evidence provided here will show that physicians joined the Nazi Party and its affiliated organisations in higher proportions than any other profession. Germany's medical and research institutions, which were part of one of the most advanced medical systems at the time, also had instrumental roles in the regime.

See Online for appendix

By contrast with the willing cooperation and acts of opportunism of so many health professionals in Nazi Germany, there is also historical evidence of non-compliant and resisting behaviours against expectations, temptations, and pressures created by the people in power. Known examples included refusal to follow the requirements formulated by the eugenic sterilisation law and refusal to cooperate with the genocidal so-called euthanasia programmes. Even more remarkable is the broad range of resistance efforts of Jewish and other persecuted health professionals—particularly the struggles of physicians, midwives, and nurses to provide medical care in the ghettos and concentration camps.

The Nazi mass murder of people with disabilities and the genocide of the Jews were both reported around the world during World War 2, but the wider international public took notice of the medical atrocities only when the post-war trials for medical crimes were held in Nuremberg in 1946–47. The verdict of the Nuremberg Doctors' Trial (also known as the Nuremberg Medical Trial) included the first international formulation of principles for ethical research on human beings (later referred to as the Nuremberg Code), which emphasised the importance of voluntary consent. However, most health professionals involved in Nazi medical crimes were never prosecuted, and many continued their careers after World War 2, sometimes reaching prominent medical positions in East and West Germany, Austria, and other countries. At the same time, most of the survivors received inadequate or no recognition or compensation at all for their suffering, and apologies from the German medical community for their crimes have been offered only hesitantly. As we will show, some of the knowledge gained from unethical and outright criminal research remains part of the medical canon even today.

The Nuremberg Doctors' Trial was followed by the 1947 establishment of the World Medical Association, the formulation of the 1948 Declaration of Geneva, and the 1964 Declaration of Helsinki, all of which were early responses to the medical atrocities of Nazi Germany. They were essential for the development of modern bioethics. According to the Declaration of Geneva, the health and wellbeing of the individual suffering human being should be the first priority of every health-care professional—a principle directly responding to Nazi medical crimes that has lost nothing of its relevance.

This Commission draws from the insights of many eminent scholars from the fields of history, bioethics, and medical education. Despite the extensive list of references, fully covering the vast relevant scholarship in these domains is far beyond the Commission's scope. Instead, we have aimed to provide a text that is universally accessible, bringing together elements from disciplines that differ in terminology, methods, and concept. We hope that the appendix, which contains additional English-language resources and a glossary of German terms, will be useful to *The Lancet*'s global readership.

The Commission expressly acknowledges that the Nazi regime in Germany is not the only instance in which health professionals have collaborated with nefarious political regimes and committed ethical transgressions and crimes. Histories of colonial violence, racism, slavery, war, oppression, and genocide exist worldwide and are often characterised by health professionals' complicity (or even leadership). Each of these cases is distinct, with specific historical contexts, and each deserves thorough documentation.[26] The Nazi period, however, is arguably the most extreme example of medical complicity in unethical transgressions and mass crimes, and it is certainly the best-documented such case. Furthermore, it transpired in a European country at the forefront of the development of the modern bioscience model. As linguist Max Weinreich noted immediately after the war, "There were in the memory of mankind Genghis Khans and Eugen Fischers [a leading German race hygienist and racial anthropologist], but never before had a Genghis Khan joined hands with an Eugen Fischer."[27]

Part 1: Historical overview of medicine during Nazism and the Holocaust

Germany before 1933: the situation of the medical profession

After World War 1, Germany was exhausted and demoralised. The war had caused a wide-reaching health crisis that was aggravated by the Spanish flu pandemic of 1918–19. Military defeat led to the end of the German monarchy, and the Treaty of Versailles imposed harsh reparation payments and the war guilt clause, and resulted in the loss of German colonies and territories. The result was a pervasive sense of crisis and national humiliation, with political upheaval, hyperinflation, unemployment, and mass poverty plaguing German society. Against this backdrop, by the late 1920s the Nazi Party had emerged as the strongest political force from an array of extreme right-wing movements.

The Weimar Republic—the era of German democracy that lasted from 1918 to 1933, when Adolf Hitler became chancellor—witnessed rapid progress in the German medical sciences and development of far-reaching public health-care programmes. With progressive reforms, women and working-class students increasingly joined the medical profession—including many Jews, who had a long tradition in medicine.[28] Large numbers of demobilised doctors also increased competition for patients, which led to declining incomes and unemployment among physicians. The professional organisation of physicians was perceived as a pressing problem, with doctors on one side who feared losing professional autonomy as a result of so-called socialisation of the health-care system, and health insurance bodies and the government on the other.[29,30] Increasingly, conservative physicians viewed the medical profession as being in decline. Many debates focused on a supposed loss of physicians' autonomy, increasing distance from patients, widespread materialism, growing dominance of the natural sciences over humanistic practice, and strong pressures towards specialisation; critics contrasted these developments with an idealised view of the doctor's mission in previous eras.[29–33]

There was a growing wave of public anti-Jewish sentiment, which often combined traditional religious prejudice with racialised antisemitism, whose claims to plausibility were rooted in scientific racism that pervaded fields such as anthropology.[29,34] The growth of antisemitism in the German medical profession was linked to the climate of dissatisfaction with the profession's economic situation.[35] Thus, the struggle for better working conditions spearheaded by the Hartmannbund—an association of physicians in private practice that still exists—became a struggle against the democratic government of the Weimar Republic. The convergence of professional interests with political motives partly explains the gravitation of many physicians towards Nazism: by 1945, 50–65% of German physicians had joined the Nazi Party, a much higher proportion than in any other academic profession.[29,36] Physicians, clearly, were attracted to the Nazi Party not only because of its racist and eugenic agenda, but also because of the promise to champion the interests of non-Jewish physicians, not least by ousting Jewish doctors from the profession.[29]

Systematic exclusion and persecution of Jewish health professionals

The strong representation of Jews in the German medical profession was reflected in the June 1933 census. Among the 51 527 physicians counted, 5557—more than 10%—were counted as Jews, who comprised 1% of the population at the time.[37] According to data from early 1933, the inclusion of Jews who had converted to Christianity raises the number to between 8000 and 9000.[29,38] The share of Jewish doctors was even higher in Berlin, where, according to one estimate, 2617 (39%) of 6715 physicians were counted as Jews.[39] The Nazis used this strong Jewish presence in the profession to stoke antisemitic resentment. One of their first formal anti-Jewish initiatives was the April 1, 1933, boycott of Jewish businesses, which explicitly included Jewish doctors' offices.[29] Just a few days later, on April 7, 1933, the Law for the Restoration of the Professional Civil Service was passed. It forbade Jews from holding positions in the civil service, including in public health and at universities. Nearly a fifth of the academics working at universities in 1933, many of them physicians, were dismissed—80% because of their Jewish descent, and 20% because they were considered political opponents.[40] Doctors in private practice were targeted by legislation dated April 22, 1933, and June 2, 1933, which excluded Jews and political opponents from receiving payments from health insurance providers. Initially, World War 1 veterans sometimes were exempted from

these measures, which meant that the legislation most strongly affected younger male doctors and female doctors of all ages.[41–43]

In the autumn of 1935, however, the Reich Citizenship Law mooted many of these earlier exemptions. It introduced new definitions of who was legally considered Jewish and stripped Jews of German citizenship, which meant, among many other grave consequences, complete exclusion from civil-service positions, including in the health professions.[29] Furthermore, the Reich Physicians Ordinance of Dec 13, 1935, prohibited the licensing of new Jewish doctors, including individuals with just one Jewish grandparent. Jews who were already licensed practitioners saw their positions become even more untenable when their contracts with private health insurers were summarily terminated on Jan 1, 1938. This escalating persecution did not meet any significant opposition from non-Jewish colleagues, and indeed was often masterminded by Nazi physicians.[29,44]

Legislation targeting Jewish physicians culminated in the Fourth Supplementary Decree to the Reich Citizenship Law (also known as the *Krankenbehandler* decree), which revoked all remaining Jewish doctors' licences on Sept 30, 1938. Subsequently, only a small number of Jewish doctors were permitted to provide medical care, and only to Jewish patients, under the derogatory title of *Krankenbehandler* (which means treater of the sick)—ie, they were denied the right to call themselves physicians.[29,45] In Austria, the Jewish community was largely concentrated in Vienna, where approximately 3200 Jewish physicians were located in early 1938, accounting for roughly two-thirds of the total. Following the annexation of Austria by Nazi Germany in March, 1938—known as the Anschluss—anti-Jewish measures that had built up in Germany over several years were implemented within a few months, leading to the destruction of the livelihood of thousands of Jewish health-care professionals, and the dismissal of over half of the members of the University of Vienna's famous Faculty of Medicine.[46–49]

In addition to persecutory legislation, Jewish doctors had to confront virulent antisemitic propaganda. One common motif was the depiction of male Jewish doctors as sexual predators seeking to exploit vulnerable so-called Aryan women.[29,50] Jewish doctors were often victims of arbitrary arrests and physical violence, which escalated to the November Pogrom (also known by the Nazi propaganda term *Kristallnacht*) on Nov 9–10, 1938, during and after which many Jewish doctors were among those deported to concentration camps.[29] Further constriction of Jewish doctors' professional lives came with the forced closure of Jewish hospitals, the only remaining places for Jewish physicians to work.[29] Very few Jewish hospitals survived World War 2, among them the Jewish Hospitals in Berlin,[51,52] Hamburg,[53] and Vienna.[54]

In the wake of increasing economic and social threats and restrictions,[55] many Jewish doctors sought to emigrate from Germany[43] and, after the Anschluss, from Austria.[46,47,49,56,57] By the time emigration became almost impossible because of the war, about two-thirds of Jewish doctors had left Germany (which by then included Austria),[47] mostly to the USA, Palestine (which was under British mandate), and the UK. Those seeking to leave faced great difficulties and were stripped of most of their assets, especially by the predatory *Reichsfluchtsteuer* (known as the Reich Flight Tax). Most countries closed their borders to Jewish refugees, and it became increasingly difficult to obtain visas for the others. The relentless pressure, persecution, and mounting obstacles to emigration contributed to a wave of suicides among Jews.[29,47,58,59] Those who managed to flee faced further difficulties as they attempted to resettle in locations where they were often considered unwelcome competitors by the established medical community.[60–65] Most German and Austrian Jewish doctors who did not emigrate were murdered during the Holocaust, including an estimated 25% of the total number counted in Germany in 1933.[29,47] Members of other health professions—notably nurses and midwives—were also persecuted for antisemitic and other reasons,[66] as were medical students.[67] The complicity and frequently active participation of German and Austrian health professionals in the persecution of their Jewish colleagues—often with deadly consequences—must be considered a massive ethical failure in its own right.

Nazi ideology

National Socialist ideology was organised around a set of dogmatic principles that, taken together, constituted an all-encompassing worldview (*Weltanschauung*). A central element of this worldview was an aggressive, revanchist nationalism aiming to overthrow the international order imposed after World War 1. National Socialism sought to destroy the democratic Weimar system and replace it with a dictatorship based on the alleged racial supremacy of the German people, the *Volk*, and the *Volk*'s claim to domination in Europe and beyond. It drew on several sometimes-conflicting elements, including authoritarian hierarchies, antisemitism, racism, sexism, and elements of fascist ideology, which was gaining traction in Italy and many other European countries. Although Nazism lacked intellectual coherence, it gained its destructive potential from its dynamic radicalisation of a Manichaean, black-and-white, good-versus-evil construction of the world, which perceived imagined enemies everywhere. The phantasmagorical culmination of this worldview was the idea of a so-called Jewish anti-race, onto whom all perceived evil was projected.

In this view, the German *Volk* was engaged in an existential struggle for its survival, which required to overcome both Judeo-Christian moral constraints and the emancipatory legacy of the Enlightenment and the French Revolution, as well as liberal, capitalist, socialist, and communist ideologies. According to the Nazi worldview, all these movements and ideas were based on

the anti-natural Jewish spirit (*jüdischer Geist*)—the threatening idea of human equality, which consequently had to be removed through the elimination of its Jewish carriers and the political, legal, social, and cultural structures that were infused with it.[68–70] The German *Volk* was considered the only true subject of history, while the state and its institutions were mere instruments to realise Germany's mission, which included territorial expansion by military aggression (often justified as bringing ethnic Germans under the control of the Reich). Individuals' rights and worth depended exclusively on their perceived value to the *Volk*—in biological terms their alleged racial purity and in broader terms their ability and willingness to contribute to the political, economic, and military mission of National Socialism.[71] During World War 2, Germany's military expansion and conquest of most of Europe became an attempt to establish a racist empire, with tens of millions of people, especially in eastern Europe, targeted by policies of violent repression, ethnic displacement, starvation, and genocide.[72–74]

The obsession with race and heredity helps to explain why Hitler's deputy Rudolf Hess could describe National Socialism as applied biology, and why medicine came to occupy such a significant place in Nazi Germany, which has been described as a biopolitical dictatorship.[75,76] Medicine's role was to purify and strengthen the German national body (*Volkskörper*) and to prepare it for its historical mission to build an empire that would last a thousand years (a concept borrowed from Christian theology). The creation of a Nazi version of medical ethics was part of this endeavour.[77,78] A core element of medicine's role was so-called race hygiene (*Rassenhygiene*). Developed in the early decades of the 20th century and based on darwinian terms of selection and struggle and Herbert Spencer's concept of survival of the fittest, race hygiene describes a set of assumptions, ideological beliefs, and practices that were intended to create a strong national body by fostering the procreation of desirable elements and eradicating those considered racially undesirable or genetically unfit. Implementation of race hygiene, which overlapped considerably with the field of eugenics, became the central pillar of public health during the Nazi period.[35,79]

National Socialist ideology was neither logically coherent nor uniform: beyond a stable core set of beliefs, there was considerable room for variation, and conflicts arose about concrete policies and strategies. Despite such internal differences, it is possible to delineate a set of general goals, structural implications, and value hierarchies that were of particular relevance for medicine and health policies from 1933 onwards. People deemed fit and worthy constituted the so-called people's community (*Volksgemeinschaft*), an imaginary collective transcending social conflicts and purified of political opponents, Jews, and other minorities (eg, Roma and Sinti). Increased resources were to be devoted to enhancing the performance of individuals and the German *Volk* as a whole. At the same time, racially defined outsiders or enemies, as well as those deemed of inferior genetic quality, were excluded from the *Volk* (and, by extension, from all spheres of life) and ultimately eliminated.[80,81] The relatively new sciences of eugenics and race hygiene were to provide the tools for this endeavour.

Eugenics and medical genetics

Eugenics was an international movement based on concepts formulated in the late 19th century.[82–84] Its principal aim was to influence reproduction in ways that would improve the biological quality of human populations (a concept whose precise meaning varied greatly depending on who was deploying it). Developments in the biomedical sciences, such as darwinism and mendelian genetics, combined with a perception of escalating crises in public health, came together to generate great professional and public interest in eugenics. Eugenics came to influence many governments' policies, albeit with substantial variations depending on specific national contexts.[83–85] In Germany under Nazi rule, eugenics—mostly referred to as race hygiene—reached its most radical manifestation.

The term eugenics was coined around 1880 by the renowned British scientist Francis Galton to describe a scientific "endeavour to further evolution, especially that of the human race".[86] Soon after, the German physician Alfred Ploetz introduced the term race hygiene. Eugenics and race hygiene were often used interchangeably, although there was considerable dispute about the scope of the proposed interventions and the exact meaning of race in this context. Both concepts shared the fundamental notions that people were, on the basis of their biological and genetic constitutions, of differing value to the community, and that discriminatory policies should be used to promote the reproduction of people judged to be of high value and to suppress the reproduction of those deemed low value. Racism, increasingly anchored in scientific thought since the late 18th century, added the notion that skin colour or ethnic origin were presumed markers of genetic, and therefore social, value, or in Social Darwinist terms, fitness. Eugenics and race hygiene entwined science and politics: the political objective of improving the biological quality of a given population motivated research programmes, and science provided legitimisation for social policy, medical interventions, and public health interventions. Furthermore, biology and medicine provided concepts that were used to interpret contemporary social and political problems and to develop policies in response. Eugenics united scientists and the state in developing and implementing interventions, ostensibly grounded in scientific knowledge, to address problems such as poverty, prostitution, criminality, substance use, and the spread of venereal and other infectious diseases.[83,84,87,88]

Eugenic thinking found fertile ground in the early 20th century, a period marked by intense concerns about perceived racial, biological, and societal degeneration. The idea was that factors such as poor nutrition, alcoholism, syphilis, immigration, the mixing of races, and the elimination of natural selection through modern hygiene and medical care would lead to the deterioration of a given population's gene pool. Eugenic thinking was also highly prevalent in processes of nation building—eg, in Australia, South America, central Europe—and shaped late-19th-century and early-20th-century immigration policies in countries such as the USA.[89–91]

Numerous, well funded scientific and advocacy organisations emerged to promote eugenics.[92,93] Some of these organisations existed until long after World War 2, such as the American Eugenics Society.[94,95] They promoted various eugenic strategies but shared similar objectives, and most advocated both enhancing health and reproduction among socially valued individuals and communities (ie, positive eugenics) and restricting reproduction among individuals and communities considered unworthy (ie, negative eugenics). Eugenic ideas and measures were propagated across the political and religious spectrum.[84,96–100] In general, the main proponents of eugenic programmes were professionals such as physicians, statisticians, anthropologists, geneticists, social scientists, lawyers, and teachers, including internationally renowned scientists like Alexander Graham Bell and William Osler, and Nobel Prize winners Charles Richet, Alexis Carrel, and Hermann J Muller.[101–103]

The history of eugenics cannot be explained without the history of genetics, and vice versa.[104–106] In the early 20th century, eugenic motivations were central to the creation of research institutions in human genetics. For example, the Francis Galton Laboratory for the Study of National Eugenics, founded in 1904 as part of University College London (London, UK), existed under that name Galton Laboratory until 2013, when it was incorporated into the UCL's Division of Biosciences.[92]

Advocacy for eugenic policies, such as forced sterilisation laws, was quite successful, especially in Germany, Scandinavia, and the USA. Beginning with Indiana in 1907, a growing number of American states legalised sterilisation of people perceived to be a threat to the health and prosperity of the population. Because their constitutionality was unclear, these laws had limited effect until 1927, when the US Supreme Court decision in Buck v Bell declared sterilisation laws constitutional, clearing the way for 21-year-old Carrie Buck to be forcibly sterilised.[94,95,107] Eugenic laws in the USA resulted in the forced sterilisation of at least 64 000 people with mental and developmental disabilities by the time the last of these laws fell into disuse in the mid-1970s.[107] Similar laws were also introduced in the Canadian provinces of Alberta and British Columbia, where sterilisation was imposed as a condition for release from institutional care.[108–111] In Europe, the first eugenically motivated sterilisation laws were introduced in the Swiss canton Vaud[112] in 1928 and in Denmark in 1929. The other Scandinavian states and the Baltic states followed suit shortly afterwards.[113] Before 1933, European eugenicists looked to the USA for the formulation and implementation of such laws. In fact, the sterilisation law introduced in Nazi Germany in 1933 was partly based on a model law that had been drafted by US educator and eugenicist Harry Laughlin and was subsequently adopted and modified over several decades in the USA. The German 1933 legislation, in turn, soon became a model for Scandinavian and US eugenicists.[114] International contacts and exchanges about eugenics between Germany and many other nations remained active until the start of World War 2 and even after that.[114–118]

In Germany, the state of medical genetics and race hygiene was compiled in a multi-volume textbook, known as *Baur-Fischer-Lenz*, which was translated into English in 1931. *Baur-Fischer-Lenz* defined the field and became, as Reich Health Leader Leonardo Conti would later declare, the foundational text of Nazi race hygiene.[119–122]

Forced sterilisations and abortions

From its very beginning, and using increasingly drastic means, the Nazi regime interfered with people's bodily integrity and reproductive capacity, starting with the sterilisation law introduced in 1933. The Law for the Prevention of Hereditarily Diseased Offspring, passed by the Reich Government and promulgated on July 14, allowed forced sterilisation on eugenic grounds and, in cases of non-compliance, permitted direct coercion, including the use of physical force.[8,80,123,124] The law was partly based on a 1932—ie, pre-Nazi—draft legalising voluntary sterilisation.[8,80,123,125] The 1933 law listed a number of conditions—namely, schizophrenia, manic-depressive illness, epilepsy, Huntington's disease, hereditary blindness and deafness, severe hereditary physical deformity, severe alcoholism, and congenital feeblemindedness—an elastic category under which ultimately 50–60% of all forced sterilisations in Germany were done.[8,80,123] The vagueness of the congenital feeblemindedness category allowed physicians and judges deciding these cases to rely on social, economic, and biological criteria that were often intertwined with racist or gender discriminatory prejudices.[8,126] For instance, persons considered social outsiders, derogatorily referred to as asocials, were often sterilised under the guise of an alleged moral or mental deficiency, and many Sinti and Roma in Germany were also sterilised after being labelled feebleminded.[127]

From 1935 onwards, forced sterilisation could be combined with an abortion as late as the sixth month of pregnancy.[8] This was the first time in German history that abortions were legalised, but they were legal only for eugenic indications. Voluntary abortions were persecuted

more severely than ever, because failure to reproduce was considered contrary to the interests of the German *Volk*.[8]

Physicians (especially psychiatrists) and other health professionals not only spearheaded the crafting of the sterilisation law, but also played crucial roles at each step of implementation. Their contribution to the law's enforcement began with the mandatory reporting of patients judged to be hereditarily diseased. Although public health officers and directors of psychiatric hospitals or long-term care facilities usually complied, many doctors in private practice abstained from reporting their patients. Importantly, there are no known documented cases of negative consequences resulting from such failure to comply with the law.[126,128] The final decisions regarding sterilisation in individual cases were taken by newly created so-called hereditary health courts, in which physicians acted both as expert consultants and judges.[8,126]

Once ordered, forced sterilisation usually involved a surgical procedure, which was done in selected regional hospitals and university clinics. From 1936 onwards, women were also sterilised via exposure to high doses of x-rays.[124] By 1945, at least 310 000 people,[7] and possibly more than 350 000 people, had been subjected to forced sterilisation,[8] including more than 10 000 people in German Silesia.[129,130] The overall numbers of men and women sterilised were similar, but the more invasive nature of the procedure in women led to a much higher frequency of complications: according to one estimate, during the Nazi period about 5000 Germans died as a consequence of sterilisation, 90% of them women.[8] Survivors often had lifelong physical and mental health problems and experienced social stigmatisation, sometimes leading to suicide (panels 1,2).[131,133]

Anti-Black racial policy led to the extralegal forced sterilisation of 600–800 children born to white mothers and non-white fathers from the French colonies who had served as soldiers during the occupation of the Rhineland after World War 1. These children were subjected to medico-anthropological assessments at the Kaiser Wilhelm Institute for Anthropology, Human Heredity, and Eugenics in Berlin,[134,135] and from 1937 onwards they were forcibly sterilised.[8,136,137] During the war, physicians such as Carl Clauberg and Horst Schumann researched methods of mass sterilisation to support the regime's genocidal policies in eastern Europe.[138,139]

Another example of forced surgical interventions were the castrations of men for alleged sexual offences, including sex with other men. The Law against Dangerous Habitual Criminals, passed on Nov 24, 1933, stipulated the castration of so-called moral criminals, who were considered to be biologically unworthy and dangerous. On June 26, 1935, the Nazi regime amended the penal code to allow men found guilty of sexual activity with other men to accept castration to avoid further incarceration. About 2300 men had undergone such mutilation by mid-1943.[8]

***Panel 1*: Forced sterilisation—victims' parents speak out**

The prospect of government-mandated sterilisation of their children led some parents to lodge appeals against decisions made by the hereditary health courts. Parents' letters to authorities reveal how individuals targeted by eugenic population policies experienced shame and humiliation.

Emil Hindemith is one such person who wrote to the health office on behalf of his son: "The measures initiated by the local health office have obviously spread in our village and, as it often happens, especially in a small village, our family became a target of gossip….As a consequence of these events my son, an introverted man, for years unemployed and disabled, experienced a mental shock and became even more withdrawn….The person who claimed my son was an idiot can only be an impertinent informer, who only wanted to take personal revenge. I'd like to mention that I'm neither Catholic, nor an opponent of the law to protect the hereditary health of the German people."[129]

Louise Christoph applied to Hitler on behalf of her daughter: "In December 1932 my daughter suffered a nervous breakdown. Schizophrenia was diagnosed. My daughter, who on the basis of a medical statement is subject to the provisions of the law on preventing the birth of offspring burdened with hereditary illness and who is to be sterilised, could never be persuaded to submit voluntarily to such an operation. My daughter considers sterilisation to be a humiliating treatment and she will feel as a second-class citizen and be expelled from society. She would rather die than experience such humiliation. She is willing to accept any other preventive measures to protect against undesirable offspring….Worrying about her life and health I turn to you as our last resort, *mein Führer*."[131]

The public health system in service of the *Volk*

The specific role of medicine during National Socialism was based on the tenet of a national body (*Volkskörper*) that needed, in the eyes of the Nazis, to be purged of non-German racial influences and elements judged to be genetically inferior. An immediate consequence of the Nazis' rise to power was the radical reorganisation of the public health system to focus on what was considered racial and genetic purification. The newly introduced concept of care for heredity and race (*Erb- und Rassenpflege*) reflected the double character of the field, which was directed both against members of the German people deemed of inferior genetic quality and against racially defined outsiders imagined as threatening the racial purity of the community.[79,140,141]

The legislative basis of this reorganisation was created with the 1934 Law for the Standardization of the Health Care System, which created a unified, centrally controlled network of public health offices under the leadership of public health physicians whose allegiance was not to individual patients, but to the *Volk* collectively. Although public health offices continued to fulfil established

Panel 2: Wilhelm Werner (1898–1940)

Wilhelm Werner was born near Nuremberg in 1898 and spent part of his childhood in the poorhouse in Nordheim am Main. After his parents divorced in 1906, Werner and his sister were temporarily placed in institutions for so-called feeble-minded children. It was probably at the St Joseph Institution in Gmünden that Werner learned to draw. In August, 1919, he was admitted to the Bavarian sanatorium Werneck with a diagnosis of idiocy.

As a result of the Law for the Prevention of Hereditarily Diseased Offspring (1933), Werner was forcibly sterilised at some point between 1934 and 1938. In 1940, Werneck was vacated to make way for an elite National Socialist school. Some patients were transferred to other institutions, but many were sent directly to the T4 killing centre at Pirna-Sonnenstein, including Werner.

Before his murder, Werner had processed the suffering he had experienced as a result of what he described as the "triumph of sterelation" in more than 40 drawings (figure 1). A staff member of the Werneck asylum took the drawings from Werner in 1938. About 70 years later they were given to the Prinzhorn Collection in Heidelberg. To this day, they are the only surviving and known works of art on the subject of forced sterilisation by a patient living in a psychiatric asylum under National Socialism.[132]

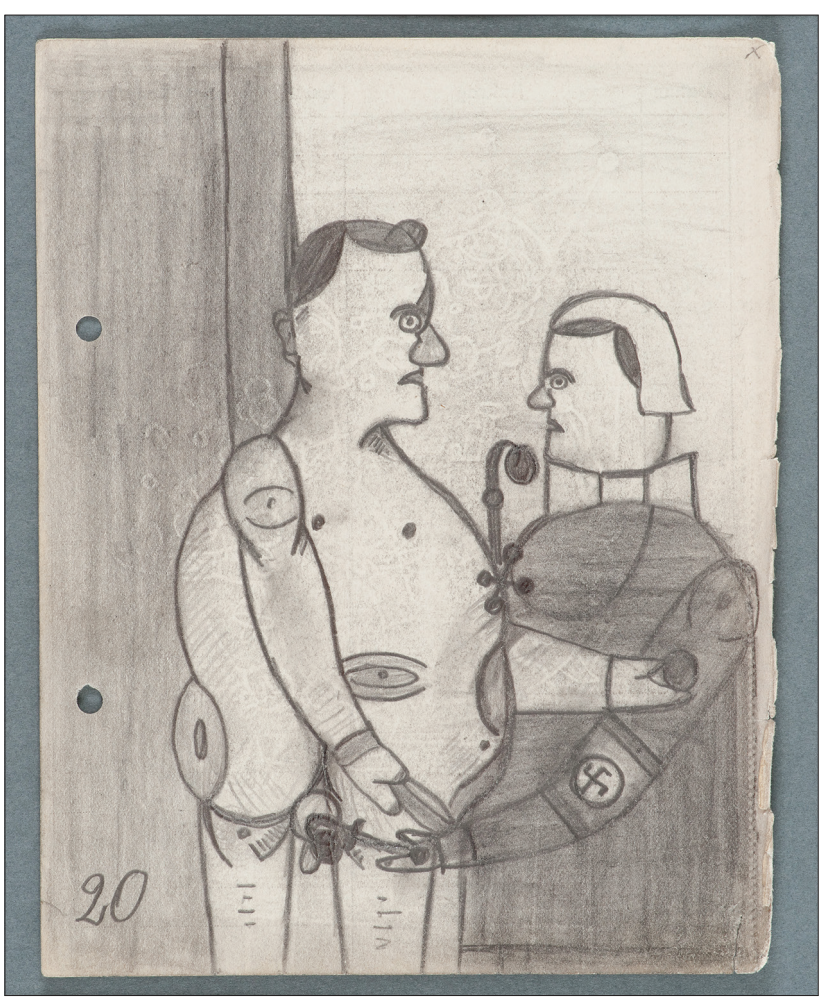

***Figure 1: Triumph of Sterelation*, Wilhelm Werner, 1930s**
Reproduced with permission from Museum Sammlung Prinzhorn.

functions, such as collation of health statistics, infectious disease control, or screening check-ups of pregnant women and children, their main role fundamentally changed according to the Nazi regime's agenda of race hygiene. A 1939 handbook for the public health service stated that "Every measure, undertaken in all areas, must be examined from the point of view of population policy, and care for heredity and race."[79,142]

This reorientation of the public health system was made possible by a comprehensive effort to collect incriminating data on families and communities (*Erbbestandsaufnahme*), resulting in the establishment of a so-called heredity register (*Erbkartei*) of a large proportion of the population. In Vienna, which, with a population of around 2 million, was the second-largest city in Nazi Germany, information was collected about 767 000 people.[143] This heredity register was designed to enable public health officials to easily assess the alleged biological value to the community of any given individual, for purposes of positive and negative eugenic measures. Despite ostensibly referring to hereditary biology, the register combined medical, socioeconomic, administrative, sexist, racist, and antisemitic categories; actual hereditary diseases played only a marginal role. Ultimately, an individual's supposed value to the community was mainly defined in economic terms, from which, in a circular argument, the alleged biological quality was derived.[144]

What followed was a reorientation of the entire welfare and public health system according to criteria of race hygiene and racial anthropology. Child support assistance, marriage loans, and other benefits were tied to a positive assessment of hereditary health by the public health offices, leading to the systematic exclusion of individuals deemed unworthy.[79,123] Couples had to obtain a certificate verifying their biological fitness before they were allowed to get married. The public health offices were also responsible for the implementation of the sterilisation law.[79,123]

Because the Nazi regime believed that only healthy people could fully serve the *Volk*, broad public health programmes were instituted to promote the health of the nation. For instance, education campaigns for the general public communicated the dangers of tobacco use and the benefits of a healthy diet, and other initiatives focused on prenatal health and cancer.[145] However, all these innovative preventive programmes were exclusionary and available only for Germans deemed worthy of them.[145] The Nazi Party, and its affiliated organisations, became an important factor in the provision of social welfare and in public health campaigns. The National Socialist People's Welfare Organisation (*Nationalsozialistische Volkswohlfahrt*) was a mass organisation that propagated the image of a socially integrated community of Germans while excluding racially defined minorities and those deemed unfit from its programmes. The organisation also ran centres where

children kidnapped from the occupied territories were selected for so-called Germanisation, often involving physicians and other health-care personnel.[146]

A special case was the *Schutzstaffel* (SS) organisation Fount of Life (*Lebensborn*), which is often depicted as being dedicated to the literal breeding of the so-called master race. In reality, the organisation established maternity homes where women considered racially worthy could give birth. These women included partners of SS members and unwed mothers, who had to undergo extensive screening of their family background and health before admission to such a facility. According to estimates, between 7000 and 20 000 children were born in Fount of Life facilities.[147–149] During World War 2, the organisation established maternity homes in Norway, Austria, France, and other Western European countries, and transit homes for children in Poland, which served as a tool for the forcible Germanisation of selected children (some found in orphanages, others stolen from their parents).[150] The number of children subjected to Germanisation procedures remains debated, with figures ranging from several hundreds to many thousands.[151–153]

The double character of so-called care for heredity and race meant that the newly reorganised public health offices also played an important—and often overlooked—role in the persecution of Jews and other racially defined minorities. At the 1935 Nazi Party Congress in Nuremberg, the German leadership promulgated the Reich Citizenship Law and the Law for the Protection of German Blood and German Honour, known collectively as the Nuremberg Race Laws. These laws introduced formal criteria defining who was legally considered a member of the *Volk* and who was excluded for having alleged non-German blood. Given the impossibility of defining race in biological terms, the laws relied on criteria such as religious affiliation, marital status, and—in unclear cases and for groups identified by skin colour—physical traits to define the legal status of each individual within the racialised hierarchy of the Reich. Several medical journals reported on the promulgation of these laws and welcomed them as important steps to safeguard the racial purity of the German people.[35,154] The Nuremberg Laws, in combination with a long list of subsequent regulations based on them, provided the main basis for measures of discrimination and persecution against Jews and other racially defined minorities, led to the social death of Jews in Germany, and laid the groundwork for their eventual deportation and extermination in the Holocaust.[154–156]

Responsibility for some of these persecutory measures fell to the public health offices, whose expanded roles in the implementation of race hygiene policy extended to the field of so-called racial policy. In cooperation with the civil registry offices, the public health offices helped to enforce the so-called Law for the Protection of German Blood and German Honour by including information about Jews, Roma and Sinti, and non-white racial minorities in their data-collection efforts. Additional contributions to the regime's racist policies included anthropological assessments of individuals of suspected Jewish or other non-German origin, which was partly based on previous methods of establishing paternity.[79,141] Many experts, including Otmar von Verschuer at the Kaiser Wilhelm Institute of Anthropology, Human Heredity, and Eugenics, earned considerable revenues with such assessments, which in some cases led to the deportation and murder of the individuals concerned.[134]

Nazification of medical education and the health professions

Shortly after its installation in 1933, the new Nazi-led government initiated a rapid process of authoritarian consolidation of institutional powers on all levels of society (*Gleichschaltung*), and issued many decrees and laws to bring all entities into line with Nazi policy and ideology. Central to this effort was the *Führer* principle, which stipulated, among other implications, that all relevant positions were to be filled at the discretion of Hitler or his representatives; Jews and political opponents were actively excluded from consideration. Health-care, social welfare, education, and research institutions were all affected, including by the authoritarian appointment of deans of medical schools, university professors, and chairs of professional associations. Universities were placed under the central control of the Reich Ministry of Science, Education and Culture in Berlin.[157–160] Several organisations affiliated with the Nazi Party, such as the National Socialist German Physicians' League and the Nazi Party's District Offices of Public Health (not to be confused with the public health offices), which answered to the Reich health leader, aimed to enforce Nazi policy and ideology. The Nazi Party also asserted direct influence on student and faculty organisations, including by recruiting spies.[161]

Sweeping changes in the education and training of German physicians and other health-care professionals were central to the Nazi regime's eugenic and racist agenda. All domains of health care were affected, including dentistry,[162] nursing and midwifery,[163–165] and medical research and practice. Race hygiene became a compulsory subject in the medical curriculum.[35] A newly founded Führer School for the German Medical Profession in Alt Rehse served to indoctrinate health professionals and refocus their roles away from obligations to individual patients and towards the health and strength of the *Volk*.[35,166] Physicians achieved a long-standing goal in 1935 with the passing of the Reich Physicians' Ordinance, which elevated the status of the medical profession and strengthened its organisations, albeit based on the tenets of the Nazi regime. The ordinance stipulated who was allowed to be a physician, effectively excluding Jews, and redefined the duties of a German doctor according to Nazi ideology.[29,140]

The nursing profession lacked social recognition and was politically divided before 1933, when the opportunity

	Estimated years	Means	Perpetrators	Victims
Patient massacres in eastern territories	1939–45	Shooting, gassing, and explosives	SS special units and others	40 000 people in psychiatric institutions in Poland and the Soviet Union, including the Belarus, the Baltic nations, and Ukraine[9-13]
Child murder programme	1939–45	Deliberate starvation, neglect, and drug overdoses	Physicians, nurses, and administrative staff	7000–10 000 children, mostly with mental disabilities, on so-called special children's wards in Germany and annexed territories[11,13,14]
Aktion T4	1939–41	Gassing in six killing centres	Physicians and other staff in killing centres	About 70 000 long-term psychiatric patients[15]
T4 special campaign against Jews	1940–41	Gassing in three of the six killing centres	Physicians and other staff in killing centres	At least 2500 Jewish people who were long-term-patients in psychiatric institutions (among the 70 000 murdered in *Aktion* T4 overall)[11,13,16]
Decentralised patient murders (including *Aktion* Brandt)	1939–45 (escalating from 1941)	Deliberate starvation, neglect, and drug overdoses (and other means)	Physicians and nurses	As many as 120 000 psychiatric patients, including forced labourers, in psychiatric hospitals throughout Germany and annexed territories[11,13,14,17,18]
Aktion 14f13 (murder of ill concentration camp prisoners)	1941–43	Gassing in three of the six T4 killing centres	Selections partly by T4 physicians, killings by T4 staff	As many as 10 000 concentration camp prisoners, mostly because they were considered no longer capable of work[11,19]

These murders were cynically described as euthanasia by the Nazis, but none of these people volunteered to be killed. In total, Nazi patient murder programmes claimed at least 230 000 victims, but this number excludes substantial portions of the German-occupied Soviet Union, for which very few data are available.[11,20] *Aktion* T4, a centrally organised patient mass murder programme, was an important step on the path to the Holocaust.[21,22] SS=*Schutzstaffel*.

Table: **Summary of systematic murders of patients in Nazi Germany and annexed or occupied territories**

arose to raise its status through integration into the new political system.[165,167] A number of professional associations competed for membership, with the National Socialist Nurses Association taking on a leading position and pushing back against the traditionally influential religious nurses.[168] Through their alignment with the regime, nurses helped to propagate Nazi health and population policy—trying, for example, to increase public acceptance of the sterilisation law.[66]

Midwives also sought to improve their professional recognition and influence by assisting with implementation of the sterilisation programme.[163,164] From 1933 onwards, the sterilisation law imposed additional duties on midwives, who now had to report to public health offices not only adverse outcomes during childbirth but also the birth of infants with possible hereditary diseases and disabilities.[164] Because a large proportion of births continued to take place in the home—despite a long-term trend towards hospital deliveries that continued even though home births were promoted during National Socialism—the cooperation of freelance midwives allowed for a substantial extension of the authorities' reach into people's private lives.[164] The profession also profited from the Nazis' ideological instrumentalisation of motherhood, whereby women were stylised as mothers of the *Volk* and received awards for bearing four or more children. The Reich Midwifery Law of 1938 ensured a minimum income for all midwives admitted to the national association, and excluded from the profession all Jewish women, politically undesirable women, and women otherwise considered unfit.[164]

In 1939, military-related fields, such as military surgery and military physiology, entered the medical curriculum.[169] Also in 1939, a subject called medical law and professional studies became mandatory for all medical students. It encompassed a Nazi version of medical ethics, making Nazi Germany, paradoxically, one of the first countries in the world to have mandatory courses in medical ethics.[78] The ardent antisemite Rudolf Ramm defined the new subject with a textbook.[170] The central principle of this version of medical ethics was that the flourishing of the *Volk* as a collective should take precedence over all other considerations.[78] Individual patients were to be seen through the lens of their perceived genetic, racial, and economic worth to the people's community. In this view, many traditional features of the patient–doctor relationship, including confidentiality, were limited to people considered worthy ethnic Germans.[171] Although Ramm conceded that German laws did not authorise physicians to shorten a life, he nevertheless instructed physicians to promote the idea that physicians should be allowed to terminate a human life in cases of incurable diseases and mental disability, and called on the state to create a legal basis for this.[170]

Medicalised mass murder

Long before 1933, there had been discussions about mercy killings or so-called euthanasia in Germany, and to a lesser extent in the US and the UK.[17,172–174] After World War 1, in 1920, German lawyer Karl Binding and psychiatrist Alfred Hoche called for the decriminalisation of the "annihilation of life unworthy of living", which in this context meant killing people with severe and chronic mental illnesses and physical and cognitive disabilities.[175] Such people were overtly referred to as "ballast lives"

(*Ballastexistenzen*), whose fate should be decided by experts.[175] In the Weimar Republic, Binding and Hoche's work was widely discussed, especially by doctors and lawyers, but met with a divided response.[17,80,175,176] However, under the Nazi regime, Germany became the only state where such active killings were actually put into practice through several distinct programmes (table), with the long-established term euthanasia—originally meaning a good death—serving as a euphemistic cover. None of the victims of these programmes volunteered to be killed.

Outside Germany, the mass murder of people with mental illnesses and disabilities began with the invasion of Poland on Sept 1, 1939. Locally initiated actions were organised in collaborations between newly installed Nazi regional leaders, health administrations, and the SS.[23,177–183] Special units killed at least 17 000 psychiatric patients.[17,23] Victims were murdered by mass shooting and by asphyxiation in mobile gas vans and in gas chambers, the first of which was created in November, 1939, in Fort VII in Posen (now Poznań).[23] The territories annexed from Poland have been described as "an experimental ground for researching and testing effective methods to kill people on an industrial scale".[178] The ostensible rationale for these murders was to free up beds and other resources to care for injured German soldiers. The mass murder of patients in mental asylums continued after the German invasion of the Soviet Union in June, 1941, with even greater involvement of the German military,[9,184–191] and at least 17 000 more people were murdered.[184]

Compared with the mass murder of patients in eastern Europe, the targeting of psychiatric patients in occupied territories in western and southern Europe is more difficult to assess. In France and the Netherlands, increased mortality in psychiatric institutions has been attributed to neglect and poor nutrition rather than intentional murder.[192–195] In Greece, about half of the population of psychiatric asylums died during the winter of 1941–42 because of food rationing by the occupying forces.[196] Meanwhile, territories incorporated into the Reich before World War 2, such as Austria and the German-speaking areas of what was then Czechoslovakia, were included in a centrally organised killing programme that after the war became known as *Aktion* T4.[197,198]

Inside Germany, the first patient murder programme targeted children with disabilities via a network of special killing wards. A ministerial circular from Aug 18, 1939, required physicians and midwives to complete a questionnaire about children with mental and physical disabilities aged 3 years or younger, an age limit that was raised in 1941 to 16 years. A panel of three experts—the paediatricians Werner Catel and Ernst Wentzler and the psychiatrist Hans Heinze—assessed the children on the basis of responses to these questionnaires. They were attached to the Reich Committee for the Scientific Registration of Serious Hereditary and Congenital Diseases, a front organisation of the Chancellery of

Panel 3: Elisabeth Hecker (1895–1986)—a physician active in organised patient murder

Elisabeth Hecker (figure 2) was among the early cohorts of women to receive a medical degree in Germany. A paediatric specialist, she was tasked with establishing the first juvenile psychiatric centres in the province of Silesia. From September, 1941, she directed the juvenile psychiatric clinic in Loben and was responsible for medical and psychological examinations of children from various welfare institutions and their further redistribution according to Nazi race policies. As part of the so-called child euthanasia programme, she ordered transfers of children to the local killing unit, and tried to bring about the killing authorisation even in cases in which the parents insisted the child be released from the clinic. Also, it is highly likely that she initiated a cooperation with the Neurological Institute in Breslau (now Wrocław, Poland) in the context of neuroanatomical research, sending tissues from the murdered victims' bodies to the institute for further studies.[202] Despite investigations of her involvement in the killing of children, Hecker continued her professional career and for decades was praised as the founder of juvenile psychiatry in Germany. In 1979, she was awarded the Cross of Merit, First Class.[203] Her past remained unknown to the public until exposed in a documentary by journalist Ernst Klee in 1995, almost a decade after her death.[204]

Figure 2: **Elisabeth Hecker, a physician active in the child murder programme**
Reproduced with permission from LWL-Archivamt für Westfalen.

the *Führer*, which also ran the T4 programme. Children selected for killing (or sometimes for further observation) were admitted to one of at least 30 so-called special children's wards (*Kinderfachabteilungen*) created in psychiatric institutions or paediatric hospitals.[199–201] Parents were deceived about the true purpose of these wards where, from 1940 onwards, doctors and nurses routinely killed children, mostly with sedatives such as barbital or phenobarbital. The deliberate overdoses caused cardiac or respiratory failure, or in many cases pneumonia—diagnoses that could serve as unsuspicious official causes of death.[199,202] The Nazi child euthanasia programme was also implemented in annexed Austria,[197] the German-speaking parts of Czechoslovakia, and districts of Poland that were directly incorporated into the Reich (panel 3). Overall, an estimated 10 000 children and adolescents with mental and physical disabilities were murdered (panel 4).[10,199]

Panel 4: Anita Andres (1940–44)

In 1941, Anita Andres (figure 3) was admitted to the Schwarzacher Hof of the Johannisanstalten (Mosbach, Germany), an institution that cared for children with developmental disabilities. She had not reached her cognitive and physical developmental milestones, and could not sit, stand, or walk on her own. Anita was one of 52 children and adolescents (19 from the Schwarzacher Hof alone) admitted to the Heidelberg Psychiatric University Hospital in 1943–44. Doctors there, led by renowned researcher Carl Schneider, included the children in a research programme that aimed to establish the differences between congenital and early acquired developmental disabilities. Anita was examined at the Heidelberg clinic for a month in 1944. Doctors advised her former foster mother not to take the child back. Shortly after this recommendation, Anita was murdered in the Eichberg asylum in Hesse. In 1998, a memorial was installed in front of the Heidelberg Hospital, which commemorates the 21 children murdered in Carl Schneider's research programme.[205,206]

Figure 3: **Anita Andres (1940–44), a Nazi victim at Psychiatric University Hospital Heidelberg**
This image comes from the Historical Archive of the Psychiatric University Hospital (Heidelberg, Germany).

Aktion T4, named after its secret headquarters at Tiergartenstrasse 4 in Berlin, relied on a centrally organised bureaucracy and sophisticated logistics to implement the first programme of systematic mass extermination by poison gas in history.[18,21,80,161,207] Despite the close involvement of state actors in these murders, the practice was not based on any law in Nazi Germany. Rather, it was extralegally authorised by Hitler himself. In a secret letter, he charged his personal accompanying physician, Karl Brandt, and the head of the Chancellery of the *Führer*, Philipp Bouhler, to "expand the powers of certain physicians in such a manner that patients who according to human judgment and based on a critical assessment of their health status are terminally ill, may be granted a mercy death" (our translation).[208] This document was backdated to Sept 1, 1939, to coincide with the invasion of Poland, indicating that those responsible for implementing the killing programme viewed it as closely related to the war. The utilitarian justification for *Aktion* T4 at the time, similar to the justification of the initial mass murder of patients in the occupied territories, was that the programme would save medical and other resources for the military, and the war in turn made attempts to keep the murders secret easier.

A large administrative apparatus with several front organisations was responsible for *Aktion* T4. The T4 organisation converted a former prison in Brandenburg and five psychiatric facilities—Grafeneck, Hartheim, Pirna-Sonnenstein, Hadamar, and Bernburg—into killing centres (up to four of which were operational at the same time). Each was staffed with more than 50 doctors, nurses, clerks, drivers, security guards, and disinfectors or stokers—euphemisms for those cremating the bodies.[209] According to records from the programme, between January, 1940, and August, 1941, at least 70 273 people residing in psychiatric facilities, including some from annexed territories (Austria, Slovenian territories of Yugoslavia, and Czechoslovakia), were murdered with carbon monoxide in the gas chambers of these killing centres.[210–214] An estimated 4200 of the victims were younger than 21 years.[215]

Under the T4 progamme, directors of psychiatric institutions were required to complete questionnaires about patients. Their responses were the basis for decisions about which patients to murder, which were made by roughly 40 expert consultant physicians in a bureaucratic process that reduced the victims to merely a few data points.[21,80,207,216] The Medical Director of T4—Werner Heyde, a professor of psychiatry at Würzburg University, until 1941, and then his successor Paul Nitsche, who was the director of a psychiatric asylum and an affiliated professor at Berlin University—made the final decisions.[21,80,217] This evidence disproves the post-war myth that psychiatry and its practitioners had been coerced into cooperation by those in power.

In fact, many in the psychiatric elite advocated for the killing of patients deemed incurable, to enable specialists to

focus on patients who could be healed and thus improve the reputation and influence of their profession. Among them was Ernst Rüdin, the Director of the internationally renowned Kaiser Wilhelm Institute of Psychiatry in Munich and President of the Association of German Neurologists and Psychiatrists.[218–220] Motivations for physicians' cooperation and complicity included opportunism, authoritarian thinking, and personal conviction.[128,221] No psychiatrist was forced to participate in these killing programmes—and some actually declined to do so without apparent repercussions.[218,222] This spectrum of responses also characterised the responses of other health-care professionals, such as nurses and midwives,[223] and ultimately the response of society as a whole. Relatives reacted in different ways to the murders, from initiating rescue efforts to indifference, inaction, or even proactive pursuit of so-called mercy killing of their family members.[224]

The murders of psychiatric patients, although intended to be secret, were soon noticed by the public.[21,161,225] Rumours circulated, leading to protests by families, members of the churches, and others. In Vienna, there were public demonstrations against the T4 transports.[226] On Aug 3, 1941, Catholic Bishop von Galen denounced the killings in a sermon that subsequently was widely distributed, adding to the unrest among the population and contributing to Hitler's decision on Aug 24, 1941 to suspend transports to the T4 killing centres.[161,225] The influence of von Galen's sermon suggests that protest could affect the Nazi elite's decisions, not least because of the importance of public support for the regime in the context of the increasingly difficult war against the Soviet Union. Notably, no similar protests arose in defence of the persecuted Jewish population—von Galen even blamed them for their own misfortunes in his sermon, relying on a traditional Catholic anti-Jewish trope.[161,225]

In the first months of the T4 programme, Jewish psychiatric patients were transported to the killing centres alongside non-Jewish patients. However, by the summer of 1940, all Jewish patients, irrespective of their diagnosis, prognosis, or ability to work, were targeted for murder in a special T4 campaign (T4 *Sonderaktion*). About 2500 were transferred to several designated transit institutions (*Sammelanstalten*) and from there to the T4 killing centres of Brandenburg, Hartheim, or Hadamar (panel 5). This special campaign marked the first organised mass murder of Jews, and can thus be considered a prelude to the so-called Final Solution—the campaign to exterminate all European Jewry.[16,21,228,229]

Meanwhile, what is now referred to as decentralised patient murder (that is, the killing of patients outside the T4 killing centres or the so-called child euthanasia programme), which had begun around the outset of World War 2, intensified after the suspension of the centrally organised T4 programme in August, 1941.[18] From 1943 onwards, the bombing of German cities frequently overwhelmed hospitals. To clear beds for patients considered more deserving of care, Karl Brandt organised the transfer of long-term psychiatric patients to other institutions, where they would be left to die or actively murdered (*Aktion* Brandt).[230] Unlike the centralised T4 programme, such decentralised killings (which were not limited to *Aktion* Brandt) and their pace were decided

Panel 5: Sonia Wechsler—a Jewish patient (1886–1940)

Born in Lithuania, Sonia Wechsler (figure 4) married in 1911, and had four children. In 1923, the family settled in Hamburg, first renting one little room, before moving to a small apartment in 1927. Financial troubles and family conflicts put Sonia under great emotional stress. By 1930, she had been hospitalised for psychiatric care several times, and in 1934 she was admitted to the Friedrichsberg State Psychiatric Hospital. Aware of the antisemitic agenda of the new Nazi regime and the increasing persecution of Jewish citizens in Germany, her husband, Tuvia, sought to move the family to Eretz Israel (the land of Israel). However, like many destinations around the world where German Jews were seeking refuge from the Nazis, Palestine under British mandate did not accept immigrants with mental illnesses. Left behind in Germany when her family fled in 1934–35, Sonia remained in residential psychiatric care.

On Sept 23, 1940, along with 135 other Jewish patients, she was sent from Langenhorn State Hospital to the Brandenburg killing centre, where she became one of 2500 Jewish people murdered as part of the T4 programme's special campaign.[227]

Figure 4: **Sonia Wechsler, a Jewish woman murdered as part of the T4 programme**
Reproduced with the permission of grandson Itamar Wexler.

on by local institutions and actors. In many institutions, psychiatrists and nursing staff either killed their patients directly or increased mortality by subjecting patients to starvation, exposure to cold, and neglect.[11,231] Patients were also murdered via intentional administration of drug overdoses (similar to the child murder programme) or, in the case of two large institutions in Lower Austria, electrocution.[232] Foreign forced labourers (discussed in more detail later in this section) in Germany who fell ill were also killed in this context.[18] By the end of World War 2, about 120 000 people had been murdered in this phase of the Nazi patient murders.[10,11]

Starting some time before Hitler's suspension of the T4 programme, T4 medical experts were dispatched to concentration camps, where they selected prisoners unable to work to be murdered. This process went by the code name *Aktion* 14f13, which was based on the file reference used in the Inspectorate of Concentration Camps to signify death in a concentration camp (14f) by means of gassing (13). The selected camp inmates were transferred to the Sonnenstein, Bernburg, or Hartheim killing centre and murdered. *Aktion* 14f13 was the first programme of systematic mass murder associated with the concentration camp system, and resulted in the deaths of at least 10 000 prisoners.[19,233,234] The increasing demand for forced labour provided by concentration camps led to an almost complete halt of these murders by spring, 1943. In 1944, however, independently from *Aktion* 14f13 and long after the cessastion of the T4 killings, thousands of prisoners from the Mauthausen concentration camp were sent to be killed at Hartheim.[235]

The question of a direct continuity between the Nazis' eugenic policies, such as forced sterilisation, and the later mass killing of psychiatric patients is controversial. Historically, eugenics and the question of terminating the lives of people with disabilities, psychiatric disorders, or terminal illnesses under the guise of so-called euthanasia were mostly considered separate issues. The discourses around both, however, overlapped substantially, particularly in terms of the attribution of differing biological and social values to human beings. Discourses on both eugenics and euthanasia invoked economic arguments and an alleged genetic burden on the national body to justify measures such as forced sterilisation and the termination of lives judged unworthy of living.[15,17,84,144]

Whereas forced sterilisation was primarily directed against people living outside psychiatric institutions who were considered likely to reproduce, the systematic patient murders primarily targeted long-term residents in psychiatric institutions who were unable to work and unlikely to have children. In the T4 programme, assessment of work performance was a decisive factor for the fate of patients, as were patients' social adaptability to asylum rules and the extent of their need for care.[10,236,237] Patients who could work were most likely to survive, and those deemed too weak, sick, or unruly were selected for murder. Eugenic criteria based on the assumption of hereditary factors in patients' conditions did not seem to be as important in the selection of who was murdered; rather, these decisions seem to have mainly been related to patients' presumed productivity.[10,236,237]

There are close, but not linear, connections between the various patient murder programmes and the systematic attempt to exterminate European Jews.[21,23] As already mentioned, the first instances of mass murder targeting Jews as a specific group occurred in the context of the euthanasia murders. By late 1940, Jewish psychiatric patients could be admitted to only one hospital in Germany, Bendorf-Sayn near Koblenz, and one in annexed Austria, Steinhof in Vienna. From there, several hundred Jewish patients were deported to the Hartheim T4 killing centre.[197] When Bendorf-Sayn was closed in 1942, more than 400 patients were deported to

Panel 6: Irmfried Eberl (1910–48)—a physician active in organised patient murder

Irmfried Eberl (figure 5), an Austrian physician and early supporter of the National Socialists, directed two of the T4 killing centres: Brandenburg an der Havel and Bernburg. Under his leadership, more than 23 000 patients were killed as part of *Aktions* T4 and 14f13. Like many other members of the T4 staff, Eberl was later transferred to the camps of Operation Reinhardt, the mass murder of the Jews in occupied Poland. In the summer of 1942, he became commander of the Treblinka extermination camp, but was dismissed after 6 weeks for failure to meet expectations. Under his brief leadership, about 280 000 Jews were murdered, a third of all victims in Treblinka. Eberl was the only physician who was transferred from the T4 programme to Operation Reinhardt. After World War 2, Eberl attempted to pursue work as a physician in West Germany, but the French occupation authorities found evidence of his crimes in Bernburg and started investigations. He was remanded in custody in early 1948 and died by suicide in his cell a few days later.[228,241,242]

Figure 5: **Irmfried Eberl (right), a physician active in the T4 mass murders, early 1942**
Reproduced with permission from Landesarchiv Baden-Württemberg, Abt Staatsarchiv Ludwigsburg.

extermination camps.[16,229,238] In occupied Poland, Jewish psychiatric patients were concentrated in the Zofiówka Hospital in Otwock, near Warsaw. Hundreds died of hunger and illness during the months preceding the liquidation of the Otwock ghetto in the summer of 1942, when an estimated 110 patients were fatally shot or deported to extermination camps.[177,239,240] In 1943 and 1944, 1443 Dutch Jewish patients, mainly from the psychiatric hospital in Appeldoorn, were deported to extermination camps.[192] Targeted for murder because they were Jewish, these patients were victims both of the patient murders and of the Holocaust; their fate connects both extermination programmes.[227]

The transfer of personnel and expertise from *Aktion* T4 to Operation Reinhardt (the genocide of Jews in occupied Poland) constitutes another link between the murder of people with disabilities or psychiatric illnesses and the Holocaust. Operation Reinhardt centred on three extermination camps—Bełżec, Sobibor, and Treblinka. Victims were usually murdered upon arrival, in gas chambers disguised as showers, and subsequently cremated, partly following methods developed in *Aktion* T4. More than 90 T4 staff, including the physician Irmfried Eberl (panel 6) and more than 20 nurses, were assigned, beginning in 1941, to what later was named Operation Reinhardt.[12,243,244] These people were among the core personnel and leaders of the Bełżec, Sobibor, and Treblinka extermination camps, where approximately 1·7 million Jews and unknown numbers of Soviet prisoners of war and Roma people were murdered.[23] The transfer of personnel and expertise from patient murders to the Holocaust is also apparent in the case of the Lange Commando's mobile gas chambers and in Chełmno, the first extermination camp in operation, where the mass murder of Jews in so-called gas vans commenced in December, 1941.[23,245,246]

Coercive research

Medicine during the Nazi period is perhaps most infamous today for the atrocious experiments on concentration camp prisoners, such as those carried out by Josef Mengele in Auschwitz (panel 7).[247,251,252] These experiments were marked by a complete disregard for the humanity of the non-consenting victims and, in many cases, by extreme brutality. Remarkably, Germany had been the first country to introduce official regulations for experimental medical research in human beings. In 1900, partly in response to a research ethics scandal in which children and women were intentionally exposed to syphilis, the Prussian Ministry of Cultural Affairs issued a directive constituting the first state regulations on human research globally.[253] However, these regulations only covered basic research to understand disease processes, not clinical research with diagnostic or therapeutic objectives. In 1931, the German Ministry of the Interior issued Guidelines for New Therapies and Scientific Experiments on Humans.[254,255] These guidelines differentiated between innovative therapeutic interventions and non-therapeutic experimentation. They not only made consent after previous appropriate instruction a necessary requirement for human research, they also formulated

Panel 7: Josef Mengele's inhumane Auschwitz experiments

Josef Mengele (1911–79) is probably the most notorious of all Nazi physicians who perpetrated medical atrocities (figure 6). However, the abundance of myths and rumours that have developed around him stand in stark contrast with the scarcity of historical sources related to his research at Auschwitz. Available evidence shows that, after his arrival at Auschwitz in May, 1943, Mengele acted first as chief physician of the so-called Gypsy Camp (*Zigeunerlager*) in Auschwitz-Birkenau (the second part of the camp, built in 1941, around 3 km away from the main camp) and later as head of the prisoner infirmary (*Häftlingskrankenbau*). He also performed selections of prisoners who arrived by train at the ramp and were divided into those who were sent directly to the gas chambers and those who were deemed fit for forced labour, thereby taking decisions about life and death of the newcomers. While performing this task he identified children and adults for his experiments—especially twins. Mengele pursued several research agendas, some of which arose directly from the immediate camp setting (eg, the causes and prognosis of noma facies, a facial gangrene associated with hunger and deprivation), whereas others originated in his long-term interests in racial anthropology and genetics. Among his studies was a project about hypothetical specific proteins, the aim of which was to establish a blood test for the differentiation of defined races. This project had been initiated by leading medical geneticist Otmar von Verschuer, Director of the internationally renowned Kaiser Wilhelm Institute for Anthropology, Human Heredity, and Eugenics in Berlin. The project received funding from the German Science Foundation, and in this context Mengele cooperated with the Kaiser Wilhelm Institute for Biochemistry, directed by Nobel Laureate Adolf Butenandt. Further projects by Mengele focused on the effect of genetic and non-genetic factors on the colour of the iris, and on the heredity of dwarfism. Whereas some of the research questions investigated by Mengele corresponded to contemporary standards of scientific debate, most of these issues were informed by the Nazi regime's race hygiene and genocidal policies. Mengele's research practices were marked by extreme brutality and a complete disregard for the humanity of the people forced to participate, as well as the unscrupulous exploitation of the resources and atrocious context of the Auschwitz camp—which allowed one human being in power to cause endless suffering and death to other human beings.[134,247–250]

Figure 6: **Richard Baer (commandant of Auschwitz from May, 1944, to January, 1945), Josef Mengele (perpetrator of inhumane experiments in Auschwitz), and Rudolf Höss (commandant of Auschwitz from May, 1940, to November, 1943)**
This image was taken in 1944 on the grounds of the *Schutzstaffel* retreat Solahütte (outside Auschwitz). Reproduced with permission from the Holocaust Memorial Museum (Washington, DC, USA).

provisions about research in vulnerable people. Although the guidelines did not constitute direct legal rules for medical research activities, they referred to, and were based on, existing laws governing physicians' conduct. Their main stipulations were therefore legally binding and in principle remained valid and available throughout the Nazi period, and their core principle of informed consent was also clearly spelled out in two editions of an introductory textbook on medical research.[254,255] To what extent these guidelines played a role in practice has yet to be clarified. No formal mechanism existed to enforce them, but Hans Reiter, Director of the Reich Health Office, referred to them in two assessments of clinical trials in German research participants.[254] Other evidence, however, points to an increasing breakdown of barriers preventing abusive and even lethal research, especially in groups deemed unworthy by Nazi ideology. At the University of Vienna's Children's Clinic, children with disabilities were subjected to dangerous and sometimes lethal research on tuberculosis and nutrition.[256] At the University of Leipzig, Friedrich Hartmut Dost, an assistant to the child murder programme's main instigator, Werner Catel, studied what was then called alimentary intoxication in infants (a poorly understood, life-threatening condition of the digestive tract): the treatment he provided was lethal in more than 70% of cases.[252]

Thus, the exclusionary ethics that created a double standard in medicine in Nazi Germany also affected research practices, meaning that ethical regulations were increasingly applied only to those considered part of the German national body, not to those excluded from it. Importantly, German research ethics regulations were completely disregarded in the context of coerced research on vulnerable groups in concentration camps, psychiatric asylums, ghettos, and other similarly deregulated spaces.[254]

Although medicine during the Nazi period is often associated with non-consensual medical experimentation, the numbers and varieties of experiments, victims, and perpetrators are not widely known. In an ongoing project, medical historian Paul Weindling and colleagues have documented more than 300 experiments, including anatomical and neuropathological research, with a wide scope of scientific goals, on more than 27 000 individuals.[24,257] Those who survived experimentation often experienced long-term health damages, due not only to the experiments themselves but also to the horrendous living conditions they were kept in, the insufficient medical care they received, and psychological trauma.[25,252,258]

Overall, four themes were central drivers of scientific studies during the Nazi period: supporting the war effort, achieving German economic autarchy, spatial expansion towards the east, and the idea of building and maintaining a healthy and strong German race.[25,252,259,260] In medicine, relevant fields of inquiry included performance physiology, the prevention and management of epidemics, the effects of chemical and other weapons, human reproduction (including searching for methods of mass sterilisation), and genetics and hereditary biology, including so-called racial medicine. During World War 2, highly crowded military accommodations and extreme living conditions in the ghettos and camps meant that typhus—transmitted by lice—was an immense medical challenge.[81] Among numerous medical research programmes, the reckless and brutal experiments in several concentration camps to create an efficient typhus vaccine stand out for their quantitative scale and the extent of collaboration they involved. Typhus experiments in Buchenwald, Auschwitz, Natzweiler, and Ravensbrück claimed hundreds of victims[25,261,262] and clearly show the cooperation between civil medical research institutions, military medicine within the German armed forces and SS, and the pharmaceutical industry. Physicians also supported the actions of the German armed forces in various other ways, including in the early phases of the war.[263]

Medical scientists interested in pursuing research projects were generally aware of what they saw as new opportunities for research in the deregulated spaces created by the Nazi regime, where legal and ethical rules could be ignored. Some investigators actively sought to pursue their research in these locations. Carl Clauberg, a gynaecologist and expert in fertility treatment, specifically requested permission from Heinrich Himmler to research female reproduction and methods of mass sterilisation at Auschwitz to contribute to Nazi racial population politics. Himmler readily granted access to the prisoners because Clauberg's work supported the regime's goal of fostering fertility in the German nation while preventing the reproduction of racially undesirable groups.[264] Clauberg subsequently ran brutal transcervical sterilisation experiments, which led to suffering, infertility, and death among the victimised women.[138,139,265,266]

Similarly, professor of surgery and leading SS medical officer Karl Gebhardt used his privileged access to the Ravensbrück concentration camp to run a series of systematic trials to test the efficiency and efficacy of sulfonamide drugs. These trials involved the intentional creation of standardised infected wounds (to imitate war wounds) on 74 young, otherwise-healthy Polish resistance fighters.[267] Some of the surviving victims, including Wanda Połtawska, later published accounts of their suffering.[268] Sigmund Rascher, a physician involved in the SS research organization Ancestral Heritage (*Ahnenerbe*), collaborated with a group of researchers backed by prominent physiologists in a series of high-altitude and hypothermia experiments on prisoners at Dachau concentration camp. These experiments involved the intentional exposure of prisoners to life-threatening conditions and, in many cases, death.[269,270] As we will discuss in more detail later in this Commission, data from these investigations were used in aviation medicine after the war, and scientists connected to the experiments were recruited for the development of US space medicine.[269,270]

Another highly vulnerable group subjected to non-consensual research were psychiatric patients, who were used for studies in neuropathology,[128,218,220,271–274] psychiatric genetics,[220,275,276] and bacteriology and virology (investigations of the transmission of infectious agents and research on vaccines).[25,277,278] In psychiatric institutions in Nazi Germany patient killings and criminal research were often integrated into everyday routines. Thus, the so-called special children's wards established in the context of the so-called child euthanasia programme were also used for non-psychiatric research, including experiments on tuberculosis vaccination and hormone studies. Once the children were murdered, their brains and other organs were investigated.[199] Heidelberg was one of the leading centers for brain research on the victims of medicalised murder,[279,280] as were Berlin, Munich, Vienna, Leipzig, and Breslau, where scientists Julius Hallervorden,[25,273,281,282] Berthold Ostertag, Hans Joachim Scherer,[202,283] Heinrich Gross, and others[284] studied victims' brains and published their results in academic journals, even decades after World War 2.[285]

Among those who profited greatly from the large numbers of Nazi victims were anatomists, who besides traditional sources such as public hospitals now had new, abundant sources of bodies.[286] Anatomical departments received the bodies of people murdered by so-called euthanasia programmes, prisoners of war,[287] forced labourers, concentration camp prisoners, victims of the Gestapo, and people executed in the regular prison system.[286,288–292] Practically all German anatomists used these bodies for dissection courses and often for research that informed anatomical knowledge worldwide. Ample access to the formerly rare resource of fresh tissues from executed people triggered relentless research and ethical transgressions.[293] For example, in 1942, Max Clara administered vitamin C to prisoners on death row,[294,295] and then studied the distribution of the vitamin in their tissues after death, effectively treating the living prisoner as if they were already a dead body.[296] This mode of escalation ultimately led to the murder of prisoners in Auschwitz for experiments on the effect of hunger contrived by professor of anatomy and SS officer Johann Paul Kremer.[297] Arguably the most egregious crime by an anatomist was August Hirt's never fully realised plan for an expansion of the renowned Strasbourg anthropological collection with a set of skeletons from Jews, for which he had 86 Auschwitz prisoners killed.[298]

Medicine and the exploitation of forced labourers

Some of the first people assigned to forced labour—even before World War 2—were unemployed German Jews and later Jews in annexed and occupied territories.[299,300] Although the camps to which they were sent—usually located close to their assigned working sites—differed significantly in size, length of existence, type of labour, and other aspects, several trends in medical care can be identified. The most important was a gross inadequacy of personnel, facilities, and supplies to treat the many sick and injured labourers who desperately needed care as a result of their brutal and unsanitary living and working conditions and the malnutrition they were subjected to.[301,302] In the early years of the war, severely sick and injured Jewish workers were returned to the ghettos from which they had originally been sent to the camps[300,302] or were dispatched to camps with larger facilities.[303] Under the Nazi Final Solution, however, the destination of the so-called return transports largely shifted to nearby extermination camps[304] or sites for mass shootings.[300] One of the first groups of Jews to be gassed upon arrival in Auschwitz comprised incapacitated labourers from camps in East Upper Silesia.[303] Although worksite and camp conditions and German officials' actions suggest the contrary, the assignment of Jewish doctors to medical posts in some of these forced labour camps[301,305,306] shows that there was at least some attention paid to the health of this massive labour force. Public health officers also sought medical expertise to prevent the spread of epidemics from inmate populations to non-Jews in the vicinity. Additionally, various groups in a position to benefit from the Jewish workers' efforts, such as municipal governments and private construction companies, pursued the recruitment of Jewish doctors to treat patients in the camps—albeit with nearly no resources.[307]

Overall, more than 20 million people were forced to work for the Nazi regime, among them foreign civilian workers, concentration camp prisoners, and prisoners of war from all occupied countries.[308] Foreign forced labourers in the German civilian economy (*Fremdarbeiter*) formed a group distinct from prisoners of war and inmates of concentration and forced labour camps. More than 12 million such labourers worked within the Reich, and, by 1944, one in every four workers in Germany was a forced labourer (mostly from the Soviet Union, Poland, France, and Italy).[309,310] Medical care for forced labourers was extremely precarious, particularly for workers from Poland and the Soviet Union (*Ostarbeiter*).[311,312] In fact, specific decrees in March, 1940, and February, 1942, placed forced labourers from occupied territories to the east of Germany in an even worse position than other groups, reflecting the hierarchy of racist thinking in Nazi ideology that placed Jews at the bottom and Slavs—viewed as a racial group that included non-Jewish Poles, Russians, Ukrainians, and others—only slightly higher. The number of forced labourers who were seriously ill and unable to work grew steadily. In so-called convalescence camps built for sick *Ostarbeiter*, poor hygienic conditions and malnourishment led to thousands of deaths, many from tuberculosis.[312] On May 21, 1943, repatriation of forced labourers who had mental breakdowns was prohibited, and as a result such labourers were deported to Hadamar and murdered in the gas chamber.[313,314] Similarly, from May, 1944, forced labourers with tuberculosis were sent to Hadamar, where at least 468 were murdered.[313,314]

Forced labour was used in all areas of the economy. In gynaecological hospitals, forced labourers not only served as a cheap workforce but also were abused for medical training purposes (eg, examination procedures were demonstrated on them).[315] From 1943 onwards, women considered racially undesirable from eastern Europe were also increasingly subjected to forced sterilisations[8] and abortions.[316–319] Pregnant women from Poland, the Soviet Union, and other eastern European countries were among the most vulnerable patients at German medical institutions during the war. At the University Women's Hospital in Graz, Director Karl Ehrhardt combined forced abortions with invasive and dangerous research.[319] If children were born, they were often separated from their mothers and placed in special institutions where many of them died of neglect and starvation.[317,320,321]

Persecuted and murdered health professionals

As Nazi Germany's territorial gains brought more Jewish populations under German control, large numbers of Jewish medical professionals were among those targeted for ghettoisation, deportation, and, eventually, extermination. In the decades before the German invasion of Poland, pervasive antisemitism,[322] manifesting, for example, in quotas restricting the number of Jews who could enrol in medical school and widespread discrimination against Jewish physicians in public health institutions and professional associations, had contributed to the establishment of national Jewish health services and health-care infrastructure.[323] Among such services was the Jewish Health Care Organisation, the Central Society for the Care of Orphans, and 47 Jewish hospitals, some of which also served non-Jewish Poles.[324] The accumulation of expertise and experience in founding and working within these Jewish medical networks and facilities arguably helped to prepare Jewish doctors and nurses to provide care under the extreme conditions created by the German occupation and the subsequent escalation of anti-Jewish measures throughout World War 2.[325,326] Although the precise number of Jewish doctors in Poland immediately before and after the Holocaust is unclear, the fact that only 103 (12%) of the 831 Jewish members of the Warsaw-Białystok Medical Chamber survived the war offers insight into the scope of lives lost.[323,327]

Although ghettoisation followed by transport to camps was the typical sequence of Nazi oppression against Jews in Poland, anti-Jewish persecution followed different patterns and timelines throughout Nazi-occupied and Nazi-aligned Europe. Despite decades of research, there is still, with some exceptions,[328–333] a dearth of scholarship on the experiences, reactions, and fates of Jewish medical professionals during and after the Holocaust. For western, central, and southern Europe, where few, if any, ghettos were established, several common elements can be identified in narratives of Jewish health-care professionals. They were forced to live under severe personal and professional restrictions (including social segregation and removal from employment in public institutions) while maintaining and delivering health services and having to grapple with ethical challenges in the face of escalating peril. These services were often overseen by community organisations and delivered in Jewish hospitals that predated the war.

In the Netherlands, for example, at least 534 Jewish doctors were expelled from positions in the public sector in November, 1940, and prohibited from treating non-Jewish patients in May, 1941. Eventually the employer of many physicians, the Jewish Council, beginning in early 1942, asked its medical workers to perform examinations of Jews who were to be sent to labour camps. From the summer of 1942, the stakes became even higher, when Jewish doctors were forced to examine Dutch Jews selected for deportation to death camps to assess whether they were fit for transport. Some doctors did what they were asked; others refused. By providing fellow Jews with false medical certificates or by performing intrusive treatments to exempt people from transport, some sabotaged individual deportation orders. At least five Jewish doctors died by suicide when faced with situations they could not morally accept; they are among the 211 Dutch Jewish doctors who did not survive the Holocaust.[334,335] Such numbers, however, do not convey the true extent to which Jewish health-care professionals all over German-occupied Europe were victims of Nazism and the Holocaust. Even those who ultimately managed to survive suffered immeasurably in the ghettos, camps, and forests[336,337] and various other hiding places where they provided medical aid.

Medical activity in the ghettos

After the invasion of Poland, the German occupying forces increasingly restricted large communities of eastern European Jews to their often densely populated and poor neighbourhoods. An old term, ghetto, was revived to describe these areas.[338,339] Ghettos varied greatly in size, duration of existence, and conditions, but all were united by the fact that Jews were forced to live there in isolation from non-Jewish populations.[340] Overall, more than 1000 such ghettos were established in German-occupied areas in eastern Europe. There were more than 400 ghettos in Poland, where approximately 3·3 million Jews (10% of Poland's pre-war population) lived before the Holocaust, and about 500 in the occupied Soviet Union. Ghettos were also established by Romania in Transnistria.[340–342] Important ghettos outside these regions included the ones in Theresienstadt (Terezín, Czech Republic) and Salonika (Thessaloniki, Greece). Theresienstadt was a camp-like ghetto that existed until the end of World War 2. It had unique features, and a varied population of Jews were deported there from other countries, including many intellectuals and professionals. Within the ghetto, health services were organised by a council of elders, which employed many

Jewish physicians. Health services became one of the most important branches of the administration.[343]

The ghettos served to control, concentrate, weaken, and eventually kill Jews, and from 1941 they became staging areas for the deportation of Jews to the extermination camps. The more strictly sealed the ghetto and the larger the Jewish population, the greater the difficulty of caring for residents in view of the mortal threats of starvation and disease.[338,344,345] One of the official pretexts for the ghettoisation and isolation of Jews was to protect the non-Jewish population and German occupiers, because Jews were accused of carrying infectious diseases, especially typhus.[323] This association of Jews with contagious diseases became a self-fulfilling prophecy: the conditions that they were forced to live in—overcrowding, starvation rations, exposure to the elements, and the absence of the bare necessities for survival—facilitated the spread of infection.[324,346] Mortality in ghettos was extremely high, with hundreds of thousands of people dying from starvation and disease.[324,345–352]

Although the Nazis acknowledged that medical services were necessary in ghettos to avoid the spread of contagion to the rest of the population, the establishment and maintenance of health-care infrastructure was generally left to Jewish doctors within the ghettos. These doctors worked with the Jewish councils—appointed by German administrators to manage internal ghetto affairs—to build as best a health-care service as was possible under the dismal conditions of the ghetto.[353–355] In the Warsaw ghetto—which was the largest in Europe, with a population of more than 400 000 people—physicians and ghetto leaders created hospital facilities for adults and children, chemical and bacteriological laboratories, pharmacies, and first-aid stations, and managed to organise clandestine education for approximately 500 medical students[346] and 80 nursing students.[356] Even medical research continued in several ghettos, with investigations of diseases that developed under the prevailing extreme conditions. For example, there were studies of anaemia, poliomyelitis, and meningitis in Theresienstadt,[357] of nutrition and growth disorders in Łodz,[358–360] and of typhus in Lviv (panel 8) and Warsaw.[366,367] Also in Warsaw, Dr Israel Milejkowski (panel 9), Director of the ghetto health department, initiated clandestine research into the effects of hunger in the ghetto. The study

Panel 8: Ludwik Fleck (1896–1961)

The medical microbiologist and philosopher of science Ludwik Fleck is considered a pioneer in the social history of science and historical epistemology. In *Genesis and Development of a Scientific Fact* (1935), he coined the concepts thought style and thought collective. Fleck's work inspired the idea of scientific paradigms and paradigm shifts as formulated in Thomas Kuhn's classic *The Structure of Scientific Revolutions* (1962). Less known is the fact that, during World War 2, Fleck was forced to work as a bacteriologist in the concentration camps of Auschwitz and Buchenwald.

Fleck was born in Lemberg in the Austria-Hungarian Empire (today known as Lviv, Ukraine) where he also studied medicine and received his PhD in medical sciences. At the beginning of his scientific career, Fleck worked under Rudolf Weigl at Lviv University's Department of Biology. In 1923, he left the university and was appointed Director of the bacteriological-chemical laboratories of the Lviv General City Hospital and also headed his own private bacteriological laboratory. After spending a year at the Institute of Serotherapy in Vienna in 1927, he became Director of the bacteriological laboratory of the Social Sick Fund in Lviv—a position from which he was dismissed in 1935, probably because of antisemitism. Until 1939, he continued work in his private laboratory. After the invasion of Poland and the resulting occupation of Lviv by the Soviet Union, Fleck returned to the university's Department of Bacteriology.

When the Germans occupied Lviv in 1941, Fleck lost his position and was deported to the Jewish ghetto of the city, where he worked in the microbiology laboratory of the ghetto's hospital. Given the conditions of famine and overcrowding in the ghetto, epidemic typhus was an acute health problem. With colleagues, Fleck developed an anti-typhus vaccination from the urine of infected patients. In early 1943, he was deported to the concentration camp at Auschwitz, where he was forced to work in the Hygiene Institute of the Waffen-SS, which served as the laboratory of the camp. In December, 1943, Fleck was transferred to the Buchenwald concentration camp to support German efforts in developing an anti-typhus vaccine suitable for large-scale production. He might also have been forced to perform serum tests (Weil-Felix reactions) to study the immune response of prisoners who had received versions of the new vaccine and then deliberately been infected with typhus. Fleck appears to have been central in the development of an effective vaccine in the Buchenwald laboratory. Together with other prisoners, he successfully sabotaged the distribution to German camp staff and soldiers by giving them an ineffective version of the vaccine, while administering the active version to his fellow prisoners.

After the liberation of Buchenwald in April, 1945, Fleck returned to Poland, where he taught microbiology at Catholic University of Lublin and wrote one of the first accounts of coerced medical experimentation in the Buchenwald camp. In 1948, he delivered a testimony at the Nuremberg IG Farben Trial about unethical medical research on camp prisoners, including deliberate infection with typhus. Fleck and his wife emigrated to Israel in 1957 because of growing antisemitism. He was appointed Director of the Institute for Experimental Pathology at the Israel Institute for Biological Research in Ness Ziona. He died in 1961.[361–365]

was done in 1942 amid extremely high mortality (there were 5000 deaths in July, 1942, compared with the pre-war monthly average of roughly 1000 among the Jews of Warsaw).[351] Around 30 physicians and scientists participated in the study while also experiencing hunger and oppression like their patients, at considerable personal risk (should their work have been discovered by the German authorities, the consequences would have been severe). Their aim was to document the Nazi crimes through scientific means, while contributing to an area of research that would be impossible to investigate in any normal clinical or laboratory setting. In July, 1942, a wave of deportations to the Treblinka extermination camp brought the research to a halt. In his introduction to the study, smuggled out of the ghetto, Milejkowski wrote that this research was the "only answer to the murderers", and that the entire world would be appalled by the documented findings.[351]

Delivery of medical care continued as long as the ghettos existed, but the amount and scope of medical services decreased as ghetto populations shrank as a result of the escalation of German genocidal policies, including mass shootings and deportations to extermination camps. In the Warsaw ghetto, physicians who were not sent to Treblinka in the massive wave of deportations in summer, 1942 continued to treat patients until the ghetto's siege and destruction, including while sheltering in bunkers during the Warsaw Ghetto Uprising in April and May, 1943.[323,324,346]

The extreme conditions under which health-care professionals had to work presented complex and unprecedented ethical dilemmas on a daily basis, some of which have been recounted in personal diaries and testimonies.[368,369] These dilemmas included questions about how to decide whether they could or should abandon their patients to save themselves,[323,370] whether to withhold care to avoid getting infected by patients,[371] whether they should imperil typhus patients by reporting them to the authorities (failure to alert the authorities could result in severe punishment),[323,371,372] and whether to help people in hopeless situations (for example in the face of Nazi hospital raids, when patients were selected for transport to the extermination camps) to die painlessly.[373] Physicians faced harrowing situations, in which they had to decide, for example, whether to kill crying infants in a bunker or hideout to save everyone else hiding with them.[323,372,374] Other difficult decisions included those about allocation of limited essential resources[375] and whom to save in the face of direct orders to choose which people would live and which would die.[376–381] Some of the ethical dilemmas were brought before rabbis and other professionals who provided guidance.[375,382–385] More often, however, health-care professionals faced this heavy burden of responsibilities and "choiceless choices" alone.[386] Overall, they tried their best to care for their patients in the most difficult of conditions, and many chose not to abandon their patients, even when they had the opportunity to save themselves.[323]

Medicine in concentration and extermination camps

Medical care in each concentration camp under the auspices of the Concentration Camp Inspectorate was overseen by a chief garrison physician who was in charge of the medical department and responsible for the health of prisoners and SS personnel. SS doctors participated in medical experiments, fabricated causes of death in death certificates, supervised executions, and selected and killed prisoners.[387–389] Until 1942, camp medical personnel were directed to provide only minimal medical care to prisoners: their principal aim was to prevent the spread of infectious diseases.[390] With Germany's worsening military situation, however, restoration of prisoners' health, at least to a level enabling them to work, was increasingly viewed as essential to enable continued exploitation of their labour for the German war economy. Inextricably linked to this objective was the selection for murder of sick prisoners whose capacity for labour was judged by the SS to be exhausted.[390]

SS doctors and so-called medical orderlies (SS men assigned to the prisoner medical facilities, even though most of them did not have any medical training) frequently killed prisoners by giving intravenous or intracardiac injections of lethal substances, such as phenol and benzene, or dispatched prisoners to gas chambers on site or in other camps.[391] SS medical staff perpetrated other crimes against prisoners, including so-called racial research, forced sterilisations, and castrations.[387,391] They also participated in *Aktion* 14f13 and contributed substantially to the pivotal role that Auschwitz played in the Final Solution, as the site where around 960 000 Jews were murdered.[392] At the arrivals ramp, medical personnel, often wearing their white coats, decided which deportees would be sent immediately to die in Birkenau's gas chambers and which would be permitted to stay alive for a time as labourers or experimental subjects.[393]

Although in general only some prisoners were eligible for some form of medical care (which patients were eligible varied greatly between camps and at different times), all large concentration camps had treatment facilities.[394,395] These treatment facilities varied in type and size, ranging from outpatient clinics consisting of a single room to hospitals housed in multiple barracks. Overall, the camps' overcrowded, unsanitary, and lice-infested conditions, and grossly insufficient medical supplies made healing nearly impossible.[391,396]

In Auschwitz, because of selections of sick prisoners starting in mid-1941, the infirmaries and hospitals became deadly traps for patients unlikely to recover. As a result of the combination of lethal conditions and selections, camp hospitals came to be known as waiting rooms for death.[397] Jewish patients were selected for gassing at much higher rates than non-Jewish prisoners, and, after August 1943, selections exclusively targeted Jewish patients.[391] These selections became a mechanism of murder within the Final Solution. The establishment of an entire sector of buildings designated as a prisoner

Panel 9: Two physicians active in the Warsaw ghetto

Dr Israel Milejkowski (1887–1943)

Before World War 2, Israel Milejkowski (figure 7) was Chair of the Jewish Medical Association in Poland. In the Warsaw ghetto, he headed the Warsaw Jewish Council's health department. Tasked to liaise with the German health authorities that operated in occupied Poland, Milejkowski joined in various acts of resistance against the German occupiers' orders. Despite dehumanising conditions, and with the support of some of the 800 Jewish physicians who lived in the ghetto, he organised medical services for the ghetto population, an underground medical school, and a clandestine research group investigating the physiological and psychological effects of starvation. Milejkowski's and his colleagues' efforts were published in 1946 in a Polish translation of the Yiddish manuscript as "The disease of starvation: clinical research on starvation in the Warsaw ghetto in 1942". Milejkowski, however, did not live to see the publication. He perished in 1943, either in the ghetto or en route to the Treblinka extermination camp.[323,324]

Dr Anna Braude-Heller (1888–1943)

One of the 30 researchers recruited for Milejkowski's hunger study was Anna Braude-Heller (figure 8), who served as Director of Bersohn and Bauman Children's Hospital and head of the medical committee in the Warsaw Ghetto. From a young age, she stood out as an independent thinker and campaigner to support schoolgirls from poor social backgrounds. In 1906, she enrolled in social science studies in Switzerland, but later switched to medicine. After several years at the universities of Zurich, Berlin, and St Petersburg, she returned to Poland in 1913. Devoted to the organisation of medical services for abandoned children and poor mothers, she founded the Children's Friends Association and initiated local welfare provisions for mothers and children in need. She also arranged for the renovation of Bersohn and Bauman Children's Hospital, which she directed from 1930 until her death during the Warsaw Ghetto Uprising. Her sister, Yehudit Braude, later wrote: "When urgent calls came from the Aryan side to leave the ghetto, she decided to stay at the hospital until the very last of the children left" (unpublished). Rather than saving her own life, she prioritised staying with her patients in the bunker during the uprising.

Figure 7: **Israel Milejkowski**
Reproduced with permission from the Ghetto Fighters Archive (Lohamei HaGeta'ot, Israel).

Figure 8: **Anna Braude-Heller**
Reproduced with permission from Yad Vashem (Jerusalem, Israel).

hospital camp, situated directly adjacent to the grounds of Crematorium III and Crematorium IV in Auschwitz-Birkenau, most clearly shows the interplay between

Panel 10: Maximilian Samuel (1880–1943)

Dr Maximilian Samuel (figure 9) was a distinguished obstetrician and gynaecologist in Cologne in Germany, where he was beloved by his patients. An ardent German nationalist and recipient of the Iron Cross for his service as a military physician in World War 1, the Jewish doctor fled to Belgium after the antisemitic violence of the November Pogrom of 1938. On Aug 31, 1942, less than a month before his 62nd birthday, Samuel, along with his wife Hedwig and teenage daughter Liese Lotte, were arrested attempting to cross the border into Switzerland. They were sent to the Drancy transit camp in Paris and from there to Auschwitz. Samuel and his daughter survived the selection and became inmates; his wife was sent directly to the gas chamber. After working as a prisoner–physician in Buna-Monowitz, a subcamp of Auschwitz, Samuel was transferred to the main Auschwitz camp at the behest of Auschwitz Chief Garrison Physician Eduard Wirths, who sought to exploit Samuel's gynaecological expertise. Shortly after his arrival on May 18, 1943, Samuel began working in block 10, where several *Schutzstaffel* (SS) physicians experimented on the women imprisoned there. He participated in the medical experiments of Wirths and Horst Schumann (another SS physician), a role for which he was later called a Jewish medical collaborator.[397]

Although there is no doubt that Samuel followed Wirths's and Schumann's orders, there is also evidence that Samuel attempted to minimise harm to the prisoners when given the opportunity.[413] When left alone during surgeries that were part of Wirths's experiments on the early detection of cervical cancer, he excised less cervical tissue than he had been ordered to. He also minimised harm by claiming that he could not perform the full number of procedures Wirths sought on a daily basis. Furthermore, Samuel seemed to have attempted to preserve fertility during Schumann's X-ray sterilisation experiments by removing the more damaged ovary and leaving the healthier one behind, and several women in Schumann's experiments were able to have children after the war. Given that Schumann became aware that Samuel's operations were not completed according to his orders, and that Wirths suspected that Samuel was not doing his tasks as instructed, the prisoner–physician's subterfuge presumably led to his execution. His story shows that individual doctors' behaviour could shift over time: as a prisoner–physician, Samuel was coerced into performing surgeries in Nazi medical experiments, but he was also a resister who paid with his life.[413]

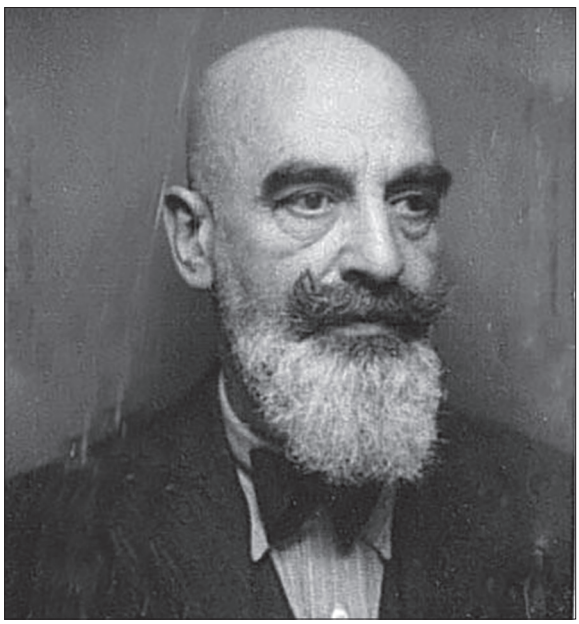

Figure 9: **Maximilian Samuel**
Reproduced with permission of the Hall of Names at Yad Vashem, and the United States Holocaust Memorial Museum.

forced labour, medical practices, and extermination. Opened in July 1943, when Germany acutely needed to increase its work force, this hospital eventually held an average patient population of 2000.[388]

Although SS doctors oversaw the prisoner infirmaries and hospitals, only the prisoner medical staff engaged directly with patients and, when possible, provided actual medical treatment. Initially, the SS deliberately filled these positions with prisoners who had no medical training whatsoever. When trained physicians worked in the facilities at this stage, their roles were limited to the lowest positions.[391] Until 1942, only non-Jewish prisoners were allowed to enter these facilities, either as staff or patients. From mid-1942 onwards, however, after the downturn in Germany's military fortunes, the SS sought out doctors and advanced medical students among the prisoner population to work in the infirmaries, where they held the title of prisoner–physician.[234,390,391,396,398,399]

Prisoner–physicians were valuable to SS camp authorities because of their specific knowledge and skills that could preserve the workforce and limit the spread of epidemic diseases. They were thus less likely to be targets of violence and generally benefited from increased food rations, and as a result had greater chances of survival compared with other prisoners.[394,400] However, prisoner–physicians' proximity to deadly contagious illnesses often placed them directly in harm's way. Additionally, their work came with a substantial emotional toll: they witnessed and at times were forced to become involved in selecting patients in the camp infirmaries and hospitals for the gas chambers.[394,400] In the face of impending selections, prisoner–physicians pursued various strategies to save the lives of vulnerable patients, including hiding[401] or discharging patients,[402] pleading for patients' lives with SS medical officers,[307] changing diagnoses to less serious ailments,[403] falsifying identities to pass patients off as having been admitted more recently, swapping samples from patients who would otherwise be murdered for having a specific illness, and recruiting patients as hospital staff.[397,404] In many cases, however, forced cooperation in

selections was a necessity if prisoner–physicians wanted to maintain their positions and use their knowledge to aid fellow inmates.[391,396,400,405,406] Prisoner–physicians also performed abortions, because, if discovered to be pregnant, women were immediately sent to the gas chambers (as were new mothers with infants).[407] These interventions, undertaken with a heavy psychological and moral burden, saved the lives of countless women.[397,407,408]

Assigned to their positions by SS medical officers, prisoner–physicians were expected to maintain the health of the labour force at least to the bare minimum necessary for exploitation. To that end, they received resources from the camp administration, but inevitably in insufficient quantities. However, their knowledge and training enabled prisoner–physicians to innovate treatments using basic supplies, such as harnessing the immune response of patients who had recovered from diphtheria to inoculate patients just beginning to show evidence of infection,[409] or capitalising on the placebo effect.[410–412] Against the background of the camps' inhumanity, prisoner doctors' kindness has also been quoted as having a salutary effect on patients.[409,413]

Ultimately, minimising the harm that Nazi doctors intended to do was often the only aim that prisoner–physicians could pursue. For example, prisoners coerced into assisting in SS doctors' experiments attempted to lessen the damage whenever possible.[413] The conduct of these prisoner–physicians is best considered within the coercion–resistance spectrum model,[307] which establishes that, although some of the doctors' actions were the result of coercive forces that the SS wielded over inmates, resistance against Nazi doctors' deadly aims also drove prisoner–physicians' behaviour (panel 10). Individual prisoner–physicians engaged in a range of behaviours, and the deciding factor, under ever-changing circumstances, was typically how much opportunity they had to resist orders at any given time.[307] However, not all prisoner–physicians sought to actively resist Nazi policies,[414] and in rare cases they collaborated—by seizing opportunities to perfect their medical skills, for example, or by pursuing their own research projects at the expense of other prisoners' welfare.[415]

Part 2: Grappling with medicine's role during Nazism after World War 2

Early post-liberation reactions

After World War 2 ended, the world tried to grasp the specifics and extent of the unfathomable death and destruction caused by warfare and Nazi Germany's policies of mass extermination, which had culminated in the Holocaust. Although there was a biomedical dimension to the regime's genocidal policies generally, medical crimes in a narrower sense included more than 300 000 forced sterilisations, more than 200 000 murders under the guise of euthanasia, and forced experiments on tens of thousands of people, many of whom were killed or left with permanent negative health effects.[7,10,11,20,24,416] The complicity of the German medical profession, more than half of whose non-Jewish members had joined the Nazi party,[29,36] was revealed, and it became apparent that their Jewish and politically dissident colleagues in Nazi Germany and the territories under its control were among those who had been killed or forced to emigrate to avoid imprisonment and death, with only a few remaining or returning after the war.[43,46,61,417]

Reports of the so-called euthanasia killings had been published in the US as early as the first months of 1941,[418] and testimonies about the mass murder of Jews by Nazi Germany featured in newspapers in Palestine on Nov 23, 1942, with calls for 3 days of public mourning. Among those who struggled to process the news of these atrocities was the Hebrew Medical Association in the Land of Israel.[419] On Dec 17, 1942, the Allies announced their intent to prosecute the perpetrators of these crimes—their only public reference to the mass murder of Jews during the war.[420]

When the war ended, more and more details began to emerge, including through testimonies by survivors who published, in different countries, their recollections of the camps and ghettoes.[421–426] The wide scope of Nazi crimes and the complicity of Germany's scientific and medical elites began to emerge in the context of war-crimes investigations and preparations for trials.[419,427–430] These reports also informed the narratives that developed in the Jewish medical community in Palestine, which received increasing numbers of survivors.[419,431] When caring for this group of patients, physicians identified a new category of human suffering that they named, in early French publications, *pathologie des déportés*—the pathology of the deported, which described a unique set of clinical findings in those who had survived Nazi persecution and imprisonment.[432–438]

Prosecution of medical crimes in Nuremberg

The Allies prepared the ground for the judicial prosecution of war crimes at the Third Moscow Conference in autumn, 1943. After the London Conference in summer, 1945, the occupying powers—the USA, UK, France, and the Soviet Union—jointly convened the International Military Tribunal in Nuremberg, Germany, which lasted from Nov 20, 1945, to Oct 1, 1946. The charges against 24 leading figures of Nazi Germany included crimes against peace, war crimes, and, for the first time in history, crimes against humanity.[439–441] Victims' and Nazi physicians' testimonies left no doubt, according to medical historian Paul Weindling, that "medicine was demonstrably a component of Nazi genocide with medical involvement in gas chambers, chemical warfare, sterilisation, euthanasia, human experiments, and plans to eradicate 'racial degenerates'."[429]

The International Military Tribunal was widely publicised and made the Nazi atrocities known around the world. It laid the groundwork for a series of

12 subsequent trials before a US military tribunal, which were also held in Nuremberg. Although medical atrocities (in the concentration camps) were also part of the fourth of these trials (which ran from April 8, 1947, to Nov 3, 1947),[442] the first of these subsequent proceedings, the Nuremberg Doctors' Trial, was clearly the most important one with regard to perpetrators of medical crimes. The Nuremberg Doctors' Trial started on Dec 9, 1946, with 20 physicians and three administrators accused of medical crimes as defendants.[428,429,443–449] They represented different levels and spheres of Nazi medical crimes—including the military, the SS, the civilian sector, and academia—to show the responsibility of a whole criminal system that was not limited to individual perpetrators.[428,429,450,451] The lead defendant was Karl Brandt, professor of surgery at Berlin University's medical school, senior medical official of the Nazi Government during the war, and Hitler's personal accompanying physician.[452] In his opening statement, Chief Counsel Telford Taylor pointed to the conundrum at the centre of the proceedings: "[T]his is no mere murder trial....These defendants did not kill in hot blood, nor for personal enrichment ... They are not ignorant men. Most of them are trained physicians and some of them are distinguished scientists."[453] Generations since Taylor have grappled with the question of how these highly

***Panel 11*: Major trials for medical crimes (apart from Nuremberg)**

Trials of patient murders

Most of the trials of the so-called euthanasia murders took place soon after World War 2.[456,457,462] The first was held before a US military tribunal in Wiesbaden, West Germany, in October, 1945, and concerned events at the Hadamar killing centre. The court sentenced the facility's chief administrator and two male nurses to death. Four other defendants received long prison sentences. This verdict set a precedent: it was the first time that the USA used the concept of war crimes in a case against civilians.[455,463]

From 1946, the Allies delegated the prosecution of the patient murders that had been carried out as part of *Aktion* T4 to the German courts, because the six T4 killing centres had been located on German territory (including in annexed Austria), and most of the victims had been non-Jewish German citizens.[464] In West Germany, T4 trials took place in Frankfurt in 1947 and in Tübingen in 1949. Many of the defendants received long-term prison sentences, and two were sentenced to death.[464] After the 1949 enactment of the Constitution of the Federal Republic of Germany, all death sentences were commuted to life imprisonment, and in the changing political context of the early Cold War, the prison terms were gradually reduced. By 1954, the last of the convicted perpetrators was released from prison.

The 1947 patient murder trial in Dresden in the Soviet occupation zone ended with long-term prison sentences for most defendants. Four people were sentenced to death, including Paul Nitsche, former Medical Director of T4. Although the leading figures of *Aktion* T4 received death sentences, defendants accused of murdering patients by intentional overdose in mental asylums received milder verdicts.[459] In Austria, the prosecution of these medical murders and other medical crimes changed during the post-war years. Sentences tended to be severe immediately after the war, with five death sentences handed down in 1946 by Austrian courts (although only two people were actually executed). After 1948, convictions became rare and previous sentences were often commuted in successive waves of amnesties.[460] In the following decades, medical atrocities committed during the Nazi period were hardly ever mentioned, a situation that only slowly started to change from the 1980s onwards. Another trial related to the Nazi patient murders did not take place until 2000.

Trials of camp personnel

Most legal proceedings against former camp personnel were held at Dachau concentration camp. The first trial, of 40 members of the Dachau staff, lasted from October to December, 1945, and resulted in 36 death sentences, including five death sentences for physicians. 28 defendants, including one of the physicians, were executed on May 28, 1946.[465] From March to May, 1946, the second in the series of Dachau trials concerned staff at the Mauthausen concentration camp. Among the 61 defendants, eight had medical backgrounds and received death sentences for their participation in the murder of prisoners and human experiments. Seven of these perpetrators of medical crimes were among the 60 people executed in May, 1947. The only defendant at the Dachau trial linked to the Hartheim T4 killing centre was Vinzenz Nohel, who had worked at the crematorium. He was also sentenced to death.[460]

Of the three western Allies, only France prosecuted any Nazi medical war crimes after 1949. In a 1952 trial of camp personnel at Natzweiler-Struthof, the only German-administered concentration camp on French territory, a military tribunal in Metz sentenced the physicians Otto Bickenbach and Eugen Haagen to forced labour for life. In 1955, only 3 years later, both were released and returned to Germany, where they continued to practice medicine.[461]

In 1947, the Supreme National Tribunal of Poland held the Auschwitz Garrison Trial in Kraków. Two defendants were trained physicians: anatomist Johann Paul Kremer and bacteriologist Hans Münch. Kremer was sentenced to death; Münch was the only defendant to be acquitted. For reasons unknown, Kremer's sentence was commuted to life imprisonment, but in 1958 he was released and returned to West Germany.[414] In the better-known Frankfurt Auschwitz Trials, which were held from 1963 to 1965, most of the accused, among them four physicians, received long-term prison sentences.[466,467]

trained health professionals who presumably saw themselves in the Hippocratic tradition of healers could have become killers.

The defendants faced four main charges: conspiracy to commit war crimes and crimes against humanity, war crimes, crimes against humanity, and membership of a criminal organisation (the SS). Specific crimes included medical experiments on concentration camp prisoners, the murder of Jews for an anatomical–anthropological collection, the killing of Polish citizens with tuberculosis, and the euthanasia murders. Despite the many people murdered under the guise of euthanasia, these programmes played a relatively marginal role in the trial, not least because the murders concerned mainly German citizens, complicating the question of jurisdiction for a US military court.[428,429,448,449] The defendants were charged with ordering, supervising, or coordinating these criminal activities, and with directly participating in them. The US judges pronounced their verdict on Aug 19 and Aug 20, 1947: seven defendants were acquitted, nine received prison terms, and Karl Brandt and six others were sentenced to death.[428,429]

Overall, the Nuremberg Doctors' Trial was limited in scope and did not account for the full extent of the medical atrocities during the Nazi era. There was a strong focus on a few specific human experiments, but acts such as forced sterilisations were downplayed[448,449]—perhaps unsurprisingly, given that forced sterilisation was legal in other countries at the time, including in many US states.[84,94,113,118,454] The fact that many German eugenicists had remained, even during the Nazi period, in high esteem among their international colleagues, some of whom shared their ideas about sterilisation and other eugenic practices, might also have played a role.[84,105] Many inhumane medical experiments with thousands of victims were also left aside, partly because the full extent of the atrocities was not yet known at the time.[24,429]

Apart from the Nuremberg Doctors' Trial, there were various other criminal proceedings dealing with Nazi medical crimes. Some of these trials were held by the Allies in their zones of occupation,[455–457] and others were the responsibility of the judiciaries of nations where such crimes had been committed. In addition to West Germany[458] and East Germany,[459] Poland,[414] Austria,[460] and France[461] held such trials, sometimes decades after World War 2 (panel 11). Despite these efforts, many medical crimes—including most patient murders—were never investigated, few medical perpetrators were convicted, and many of the perpetrators in both East and West Germany continued their careers in clinical practice or academia despite the official commitment to denazification.[158,456,457,468–470] Prominent medical scientists who had used the bodies of victims of Nazi persecution in their research also mostly evaded prosecution, including, for example, the neuropathologist Julius Hallervorden (panel 12).[281,283,285] The reasons for the low number of persecutions are manifold. Some of the most notorious perpetrators of medical crimes were dead or on the run (eg, Josef Mengele). Furthermore, political priorities shifted during the Cold War towards consolidation of the two confronting blocs in the west and the east (including the respective parts of divided Germany), and the USA began exploring options to use scientific knowledge gained in Nazi Germany.[472] At the same time, this shift of focus allowed the German medical profession to pursue its wish to move on from the past.[473] In addition, some nefarious medical practices were only much later recognised as forced human research.[295] The implementation of the denazification of German society in general, and the health-care system in particular, was inconsistent from the start. The goal to remove former Nazi Party members and other politically compromised people from their positions conflicted with the need to keep the health system functioning in a country facing widespread collapse. In effect, suspensions of doctors from clinical positions and private practice were often short-lived, and by 1946, most German and Austrian doctors who had been involved in Nazism were back in their jobs and practices.[29,158,470,474,475]

Nevertheless, the well publicised trials of medical perpetrators provoked intensive debates on the ethical standards of the medical profession and contributed,

Panel 12: Brain specimens from Nazi victims at Max Planck Institutes

The Kaiser Wilhelm Institute of Psychiatry (Munich, Germany) and the Kaiser Wilhelm Institute for Brain Research (Berlin-Buch, Germany) were leading research organisations in their fields long before World War 2. During the war, scientists from both institutes used the ample opportunities offered by the so-called euthanasia killings and other crimes to collect brain tissue for neuropathological research. Julius Hallervorden (1882–1965), head of the department of neuropathology at the Institute for Brain Research, went so far as to personally remove the brains of victims immediately after they had been gassed at the T4 killing centre in Brandenburg. Children seem to have been selected for killing at Brandenburg specifically for scientific purposes.

After the war, most of the scientists involved, including Hallervorden, continued their careers largely unhindered. The brain specimens remained in the collections of the institutes and continued to be used for scientific studies and publications. Their origin and the victims' fates were largely ignored by the scientists and wider German society. The silence was broken only sporadically, as when Hallervorden boasted about his collecting activities to Leo Alexander, who was investigating war crimes in preparation for what would become the Nuremberg Doctors' Trial.

In the 1980s, West German journalist and scholar Götz Aly alerted the public to the provenance of many of the brain slides then held in the Max Planck Institute for Brain Research (Frankfurt, Germany)—the successor to the Kaiser Wilhelm Institute for Brain Research. Reacting to public pressure, the Max Planck Society (successor to the Kaiser Wilhelm Society) organised a hasty burial of specimens in Munich in 1990, which left many questions unanswered.

In 2016, the rediscovery of human tissues from Nazi victims at the Max Planck Society's archive in Berlin led to a renewed effort to deal with this chapter of history. An extensive research project was tasked with identifying all victims of Nazi crimes whose remains were used for research within the Kaiser Wilhelm and Max Planck institutes, and with analysing the organisation's past policies on this issue.[282,283,285,471]

directly and indirectly, to the formulation of international codes and declarations on medical ethics.[476–481] During the preparations for the Nuremberg Doctors' Trial, the absence of any international professional consensus on the ethics of human research became obvious. Leading British and US medical researchers, including the delegate of the American Medical Association, Andrew Ivy, realised that questions raised at the trial not only were relevant to German medicine, but also had the potential to threaten public confidence in human research in general.[254,429,477,482] As a result of these discussions, the trial was used as a platform for the formulation of a new set of ethics principles that would henceforth guide research on human beings. Several years later, these recommendations, published as part of the final verdict, became known as the Nuremberg Code.[477]

Post-war debates on medical ethics, bioethics, and the Nuremberg Code

The verdict of the Nuremberg Doctors' Trial laid out the first international guidelines on research on human beings, known as the Nuremberg Code. The publication of the Nuremberg Code is often positioned as the origin of contemporary research ethics standards.[483–485] However, it is also widely acknowledged that Germany introduced strong research ethics guidance before World War 2—guidance that was never fully enforced and often ignored, especially in spaces like psychiatric asylums and concentration camps.[253–255,486]

The main points of the Nuremberg Code were presented during the Nuremberg Doctors' Trial as matters of consensus, but the idea of creating formal international guidance about research ethics came from the same discussions that led to the trial being held.[428,429] Field research by the Allies intelligence services uncovered evidence of such barbarous medical experiments that the concept of medical war crimes,[430] or crimes of a medical nature, was created. To investigate these crimes, the Allies formed an international scientific commission, which also launched a project to create international guidelines to regulate medical research at a meeting in Paris in 1946. However, when the USA decided to hold the Nuremberg Doctors' Trial as the first of 12 subsequent trials, the international scientific commission project was moot and the task of creating guidelines was effectively passed on.[482] Subsequent testimony at the Nuremberg Doctors' Trial included discussion of "permissible medical experiments" by expert witnesses, and the final verdict set out ten related criteria.[487] The first and most elaborate of these criteria was the requirement of "voluntary consent" based on "sufficient knowledge and comprehension of the subject matter".[477,487] This criterion was complemented by a further provision emphasising the autonomy of experimental participants and participants' right to withdraw from the experiment at any time.[483,484,486]

It took about 15 years for the ten criteria in the trial verdict to become known as the Nuremberg Code. The scope and depth of the influence of Nazi medical crimes and the Nuremberg Doctors' Trial on the subsequent formulation of ethical standards for medical research and practice, and on bioethics more generally, are still debated. On the one hand, the influence of the Nuremberg Code is undeniable. The presence of international observers and media at the Nuremberg Doctors' Trial ensured that the new principles on human research ethics were widely debated and publicised in the medical press.[431,479,488] The criteria served as a reference in various circumstances,[489] and were invoked by the French Academy of Medicine during the Natzweiler-Struthof trial in 1952,[490] and by the US Army during the Cold War.[491,492] Other documents on research ethics—eg, the 1952 Declaration of Jerusalem[493] and the World Medical Association's 1964 Declaration of Helsinki—were clearly written in dialogue with the Nuremberg criteria but did not directly reference them.[479,494] The American Medical Association and the pharmaceutical industry successfully argued to weaken the Nuremberg informed consent principle before inclusion in the Declaration of Helsinki.[479] On the other hand, unethical research (including experimentation without consent) remained widespread in many nations long after publication of the Nuremberg Code and, for reasons that are still debated, the Nuremberg Code was never formally adopted as a regulatory or legal standard in any country.[485,494,495]

In terms of the ethics of medical practice, several key events took place after World War 2. For instance, the World Medical Association was established in 1946–47, and one of its first actions was to create a new version of the Hippocratic oath, known as the Declaration of Geneva (1948), which directly echoed sentiments expressed at the international scientific committee meeting in Paris in 1946. This modern, secular oath emphasised that race, religion, nationality, political standing, and social standing should not influence physicians' treatment of patients, and it asserted that the health of the individual patient should always be physicians' ultimate goal. These core provisions should be read as an explicit rejection of Nazi medical ethics, even though the Declaration of Geneva makes no mention of Nazi medical crimes.[496,497]

The World Medical Association went on to promulgate, in 1949, the International Code of Medical Ethics, which lays out similar ethical principles and professional duties of physicians in education, practice, and, in a later revision, society.[496] In its 2022 iteration, the International Code of Medical Ethics addresses patient autonomy, physician wellbeing, and equity and justice in health care, and examines issues including telemedicine, environmental sustainability, advertising, and social media, aiming to "provide a common ethical language for the medical profession and strengthen professional identity".[497] However, the context in which the International Code of Medical Ethics was written in 1949 suggests a competition for who should be in charge of

defining and establishing international ethical standards rather than any perceived need to again reject Nazi medical ethics. Indeed, at that time, the World Medical Association was reacting to various competing attempts to establish international ethical codes and regulations, and the organisation of the First International Congress on Medical Ethics by the French medical association (1955).[498–501]

Finally, the larger field of bioethics also emerged during the decades after World War 2, and there are various narratives of its origins.[502,503] These narratives suggest that bioethics arose in response to scientific advances and expensive new technologies, such as organ transplantation, renal dialysis, and critical care units, or that the field reflects the academic version of the social upheavals and loss of trust in authority figures and institutions that occurred in the late 1960s and early 1970s,[502,503] or that it developed in reaction to scientific whistle-blowers, including public revelations of the US Public Health Service's unethical "Study of Untreated Syphilis in the Negro Male",[495] done in Tuskegee (Alabama, USA). These narratives are not mutually exclusive, of course, and a strong argument can be made that the origins of modern bioethics can also be traced back to the medical atrocities of Nazism and the Holocaust.[476,477,503–505] The intense focus of contemporary bioethics on individual autonomy and human rights can be viewed, at least partly, as a repudiation of Nazi physicians' explicit rejection of individual autonomy and human rights as values in health care.

Panel 13: The Pernkopf atlas

The Austrian anatomist Eduard Pernkopf (1888–1955), Dean of the Vienna Medical Faculty and Director of the Institute of Anatomy, Vienna, used the unrestricted access to the bodies of executed Nazi victims as the basis for his "Topographical Anatomy", known as the Pernkopf atlas, which he had begun in the early 1930s. A substantial number of the atlas images created during the war years are very likely to depict victims of the Nazi regime. Pernkopf's institute was assigned the bodies of more than 1377 people executed in the Vienna prison system, by the military, or by the secret police between 1938 and 1945. Most of these people were convicted for political reasons, such as resistance activities against the Nazi regime. Seven of them were identified as Jews. The medical illustrators documented their Nazi sympathies by integrating Nazi symbols such as swastikas into their signatures (figure 10).

Despite its origins, the Pernkopf atlas gained great popularity with anatomists, surgeons, and medical illustrators. After the publication of the first US edition in 1963–64, questions arose about the work's political background. Catalysed by inquiries from US scholars, investigations into the rumours about the Nazi connections of Pernkopf and that victims of the Nazis were depicted in the atlas were first initiated in the 1980s. A public debate on the ethics of using the Pernkopf atlas ensued in the mid-1990s, resulting in a 1998 report commissioned by the University of Vienna. The atlas was taken off the market by its publisher, Urban & Schwarzenberg, but people—especially surgeons— continued to use it.

Debates about the ethics of using the Pernkopf images, especially in certain surgical situations, re-emerged in 2016. The result of this discussion was the Vienna Protocol, a responsum (ie, an opinion based on formal Jewish law [*Halacha*]) written by Joseph Polak, a Holocaust survivor and rabbi. Polak concluded that most Jewish religious authorities would allow the use of the Pernkopf images for the purpose of saving a life, which is a priority according to the principle of *piku'ach nefesh* (פיקוח נפש). However, this use is tied to the absolute condition that it is made "known to one and all just exactly what these drawings are. In this way, the dead are accorded at least some of the dignity to which they are entitled."[532–535]

Health effects of Nazi persecution

The manifold forms of persecution during the Nazi regime led to a broad array of physical and mental health effects—both immediate consequences and long-lasting, sometimes-lifelong, ailments. Many of these illnesses had

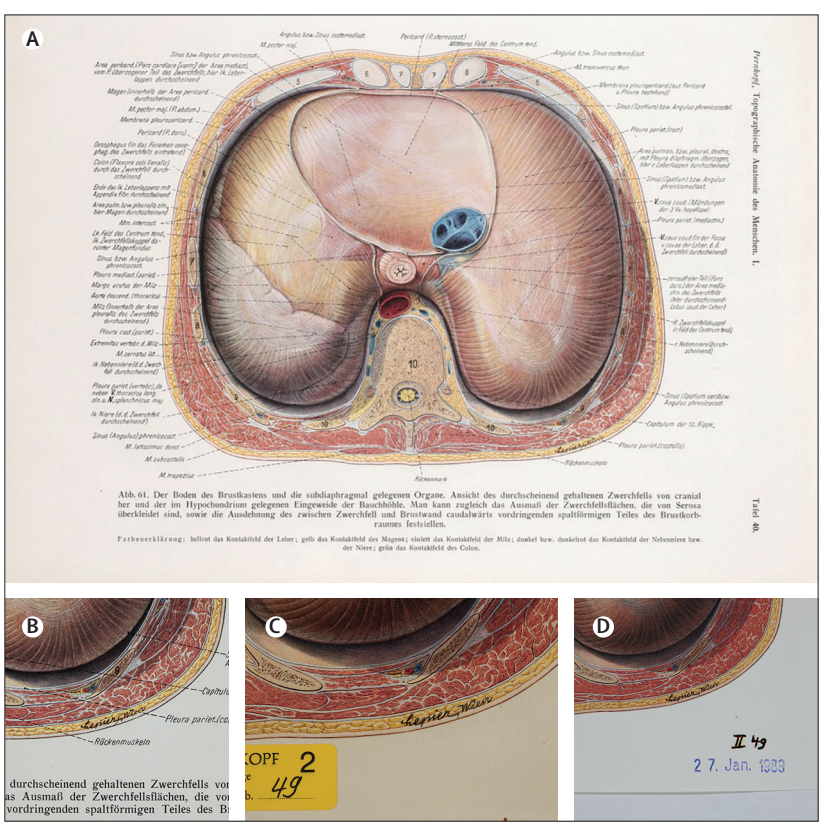

Figure 10: **Images from the Pernkopf Atlas featuring Nazi symbols**
(A) A sample image from the first edition of the Pernkopf Atlas published in 1937. The other three images are close-ups of the same illustration: in the published first edition (B), the original drawing (C), and a proof version for the third edition, 1989 (D). In (B) a swastika can be seen in the signature of the illustrator, Erich Lepier (who started including the symbol in his signature before Austria's annexation to Nazi Germany), but the swastika has been retouched out of (C) and (D).

never previously been studied, prompting research efforts, some of which continue to this day. However, early investigations on the health effects of Nazi persecution had already started in the ghettoes and camps under Nazi rule. Arguably the best-known example of such basic research seeking to scientifically document victims' suffering was the previously discussed series of studies on hunger in the Warsaw ghetto, which provided the first in-depth research on extreme hunger in the medical literature and remain a symbol of the resilience of the involved researchers, themselves de-facto prisoners (few survived to see the publication of their findings in 1946).[346,351,506] However, ethical questions have been raised, given that the experiments involved patients who were severely exhausted from starvation and, at least in some cases, unwilling to participate.[507,508]

After the Liberation, it quickly became clear that the survivors of Nazi persecution had severe health consequences,[509] which varied depending on the type of harm endured and survivors' post-war access to treatment and support to ensure their health and welfare.[510] Immediate health complications that were documented included physical and psychological trauma related to war, deportation, humiliation, incarceration in ghettos or concentration camps, constant exposure to violence, the threat of death, starvation, infectious diseases, and extreme weather conditions, and injuries from accidents, beatings, torture, and shootings.[510–512] A specific concentration camp syndrome was also described.[512] Health professionals who were also survivors discussed treatment options in professional settings and with survivors' organisations. In 1954, participants at a survivors' medical conference in Copenhagen explicitly demanded legislation to support their needs.[513] Subsequently, the long-term effects of persecution were extensively researched. Among the noteworthy findings published in the past 5 years were data suggesting that experiencing the Holocaust was a significant risk factor in late-onset cancer morbidity and mortality among long-term survivors (despite reduced all-cause mortality compared with the general population)[514] and in ischaemic heart disease among male survivors.[515] Although the association between being a survivor of Nazi persecution and increased suicide risk remains controversial, an increased prevalence of post-traumatic stress disorder and depression has been recorded in survivors.[516–518] This finding is important because directly after World War 2, the question of whether trauma such as concentration camp imprisonment could lead to long-term psychological effects was controversial, and the connection was clearly recognised only in 1964.[519,520] A condition termed post-traumatic growth has also been described on the basis of a study[521] showing that some survivors had increased resilience and ability to thrive despite previous trauma. That study showed no difference in general health measures of survivors compared with the general population, but significantly reduced subjective health perception. Importantly, survivors' trauma can affect the health of their children and grandchildren, in a process that has been described as intergenerational transmission of Holocaust trauma,[522] with explanations focusing also on epigenetics.[523] Together, all of these findings shape the treatment of the ageing population of survivors: care needs to be informed by the specific history of these patients' and their families' suffering.[509] Knowledge gained from these studies can also be applied in the treatment of other traumatised populations.

Assessments of survivors' health were used as arguments in the first compensation claims in 1949.[524] Previous state laws in the Western occupation zones were adopted into federal law in West Germany more than a decade after the end of World War 2 with the 1956 Federal Act on Compensation for Victims of National Socialist Persecution. Applied retroactively from October, 1953, the act covered people who were persecuted for political, racial, religious, or ideological reasons during the Nazi era,[525] but left out other victimised groups—notably those subjected to forced sterilisation[133,138,526,527] and the families of people murdered as part of the so-called euthanasia programmes. Germany did not recognise the 1933 sterilisation law as unconstitutional until 2007, and compensation for the surviving victims of forced sterilisations was introduced only in 2011.[526] The families of the people killed in the patient murder programmes have never received any compensation.[527]

Medical knowledge gained in unethical contexts

After World War 2, the broader medical community began to minimise the relevance of scientific work by the German and Austrian research establishment during the Nazi period by claiming that it was pseudoscience, a tendency that still persists. This minimisation was partly motivated by the community's desire to distance itself and its research from the perpetrators of medical crimes. However, a substantial amount of the medical research done in Nazi Germany, including some of the non-consensual human research, was based on contemporary medical scientific rationales, as evidenced by the publication of the findings of this research in international journals. Some of these findings were read and applied throughout the world for many decades, and have since been integrated into general medical knowledge.[105,270,281,283,293] For example, among the data that Leo Alexander, chief medical advisor at the Nuremberg Doctors' Trial, collected for the Allied Forces in preparation for the Nuremberg trials were those from the deadly altitude and hypothermia experiments in Dachau, which were shared with the US aviation industry.[269,270] Several of the scientists involved in this research, including Siegfried Ruff and Hubertus Strughold, were recruited immediately after the war by the US Army Air Force to work at the US Aeromedical Center in Heidelberg. Strughold had a

high-profile career in the US Space Program, and has been praised as the father of space medicine.[269,270,528] Data from the Dachau experiments were used even as the validity and ethics of doing so were intensely disputed.[529,530] As recently as 1988, scientists at the US Environmental Protection Agency proposed the use of results from Otto Bickenbach's phosgene experiments on prisoners at the Natzweiler-Struthof concentration camp to guide new animal experiments related to phosgene pollution regulations—a plan that was abandoned only after protests by a group of their colleagues within the Agency.[531]

Results from Nazi research have been used—with or without discussion of ethical concerns—for many years. An instructive example is the Pernkopf anatomy atlas (panel 13): re-drawings of the Pernkopf images—some of which were based on the bodies of Nazi victims—have been copied for many other publications and anatomy atlases such as *Sobotta*, often without reference to the original.[536,537] Thus, the history of the Pernkopf atlas has become an important case study for surgeons, anatomists, medical illustrators, librarians, and others in discussions about medical knowledge obtained from unethical origins, the history of anatomical illustrations, and the historical legacies of medical abuse.[535,538] Other legacies from medicine and research in the Nazi period include eponyms derived from the names of perpetrators of medical crimes (panel 14)[545–547] and scientific collections of human remains that could include the remains of Nazi victims (and the scientific publications that such collections made possible).[471,548] These legacies have direct implications for contemporary clinical and scientific practice, which we will discuss in further sections of this Commission.

The German medical establishment after 1945

The East German, West German, and Austrian medical and bioscientific profession, including its professional associations, took a long time to critically assess its actions during the Nazi era. There were decades of silence and cover-ups of the actions of health professionals across disciplines and institutions, and when the subject was broached at all there was denial of involvement and refusal of responsibility.[46,473] Finally, in 1997, Hubert Markl, president of the Max Planck Society, established a groundbreaking research programme to reconstruct the role of the Kaiser Wilhelm Society (the predecessor of the Max Planck Society) during National Socialism, including its complicity in non-consensual human experiments. In 2001, Markl offered an apology (panel 15).[549] However, these highly publicised events were quite controversial, including among survivors. Similar acts of apology by various medical associations followed, but were criticised by political scientists and philosophers as ambivalent—if not empty—political rituals.[550] These controversies raise questions about whether investigations and apologies could ever be sufficient or met with forgiveness (panel 15), or whether there is something more that could or should be done to ensure the remembrance of medical crimes and their victims.

Although the discipline of psychiatry and its professional associations were most heavily involved in medical crimes, it was not until 2010 that Frank Schneider, then President of the German Association for Psychiatry, Psychotherapy and Psychosomatics, acknowledged his organisation's responsibility and apologised to victims and their relatives.[473,552] Further steps included rescinding of the honorary memberships of former T4 expert consultants and funding of detailed historical investigations into the association's role in Nazi Germany[218] and its actions in the post-war period.[553]

In the past few decades, several other medical professional societies and research institutions, as well as the German Research Foundation, have made efforts to confront their

Panel 14: Eponyms, or what's in a name?

Named after Nazi collaborators

- *Asperger's syndrome*: This neurodevelopmental condition is named for paediatrician Hans Asperger (1906–80), who, although described as a "courageous defender of his patients against Nazi 'euthanasia'",[539] had sent some of his young patients to a killing centre in Vienna, Austria, which was part of the so-called child euthanasia programme. The name Asperger's syndrome has fallen out of favour, and instead the condition is now considered part of autism spectrum disorder.[539]
- *Wegener's granulomatosis*: A rare disorder that causes inflammation of the blood vessels in the nose, paranasal sinuses, throat, lungs, and kidneys, Wegener's granulomatosis is named for Friedrich Wegener (1907–90), a German pathologist who was an early member of the Nazi Party and the *Sturmabteilung* (SA). Wegener served in the health office of the civil municipal authority in occupied Łódź (then Litzmannstadt), Poland, during the war. Wegener's granulomatosis is now known as granulomatosis with polyangiitis.[540]
- *Reiter's disease*: This inflammatory polyarthritis was named for Hans Reiter (1881–1969), an active Nazi official and President of the Reich Health Office. He organised medical experiments on concentration camp prisoners in Buchenwald. Reiter's disease is now commonly referred to as reactive arthritis.[541]

Named after Nazi victims

- *Frey's syndrome of gustatory sweating*: Neuroanatomist Łucja Frey (1889–1942) first described the pathophysiology behind this clinical presentation in 1923.[542] She was murdered by the Nazis either in the ghetto in Lemberg (now Lviv, Ukraine) or in the Bełżec extermination camp in 1942.[543]
- *Niemann-Pick disease*: This group of severe inherited metabolic disorders, in which sphingomyelin accumulates in lysosomes in cells, was named after Ludwig Pick (1868–1944), who was head of the pathology department at the municipal hospital in Friedrichshain (Berlin, Germany) and an internationally renowned scientist and educator. The Nazi regime first forced him into early retirement, then deported him to be murdered in the Terezín concentration camp in 1944.[544]
- *Ellis-van Creveld syndrome*: This inheritable disorder of bone growth is named after Simon van Creveld (1894–1971), who was a Dutch paediatrician. He was expelled from his position as professor at the University of Amsterdam by the Nazis and imprisoned in a concentration camp in 1941. After the war, van Creveld was reinstated as Chair of Paediatrics and continued a prolific scientific career.[545]

Panel 15: Jona Laks

Jona Laks (figure 11) was born Tauba Fuchs in Łódź, Poland, in 1930. Jona and her twin sister Miriam were 9 years old when the German army invaded Poland. The twins were first held in the Lodz ghetto with their seven siblings and their parents, Loba and Mordechai Fuchs, who were murdered in 1942 at the Chelmno extermination camp. Jona, Miriam, and an older sister, Chana, were deported to Auschwitz in August, 1944. Jona and Miriam were selected for Josef Mengele's twin experiments and thus avoided immediate death in the gas chambers. Having survived Mengele's experiments and a death march, the twins were liberated near Leipzig on May 8, 1945. Jona immigrated to Palestine in 1948, joined the Israeli army, and later worked as a beautician and journalist. In 1957, she married Joshua Laks. Today she lives in Tel Aviv.

Jona was a founding member of the Organization of Mengele Twins. In June, 2001, she and seven other survivors of criminal medical experimentation in Nazi concentration camps were invited to a Max Planck Society symposium about the Kaiser Wilhelm Institutes' (as the society had previously been known) history of human experimentation and links with Auschwitz. Hubert Markl, then President of the Max Planck Society, offered an apology—or, more precisely, an acknowledgment of the society's guilt combined with a commitment to a thorough historical reappraisal—to the survivors present and to all other victims of Nazi medical crimes.

The symposium was held at a time when the ritual of issuing public apologies for historical wrongs had become an increasingly common occurrence internationally. Eva Mozes Kor (1934–2019), another surviving Mengele twin, who lived in the USA, had been one of the most outspoken voices calling for an apology and had ultimately prompted the Max Planck Society to act. Although the Mengele twins who had come from Israel appreciated the Max Planck Society's offer to apologise, they did not feel entitled to offer forgiveness. In her address to the society's representatives, Jona demanded a wider engagement with the past and its victims, an engagement that would go beyond apology and historical reconstruction:

> "I am an emissary in the elementary sense of the word—an emissary of those of Mengele's victims who are still alive….If I forgive in the name of the dead, I will be going beyond the bounds of the mission that I have taken upon myself….As for those of Mengele's victims who are still alive…I have received no permission from them to forgive on their behalf. Nor do I as an individual have the right to forgive. Hence, I have no one's power of attorney to forgive, but to remind that forgiveness erases memory….And here, ladies and gentlemen, we come to a cruel and exclusive thing: the victims' sincerity. We are the victims. You are the present heads of the Max Planck Society. You want to clear up the Nazi crimes. We…ask not only ourselves to remember, but you as well. In other words, we are asking you to remember what you want to clear up and then perhaps forget. We will remember in any case. Will you forget in any case?"[549–551]

Figure 11: **Jona Laks, survivor of Mengele's experiments, in 2001**
This picture was taken at the Max Planck Society's symposium about biomedical sciences and human experimentation at the Kaiser Wilhelm institutes during World War 2, at which Laks gave a speech. Reproduced with permission from the Max Planck Society (Berlin, Germany).

pasts by documenting their histories in Nazi Germany,[554] issuing statements of responsibility, and offering public apologies.[555] Notably, after concerted pressure from medical historians and some physicians, the German Medical Assembly (the German Medical Association's annual general meeting) issued an apology known as the Nuremberg Declaration of 2012, which explicitly acknowledged responsibility for Nazi medical crimes and committed to honouring the victims and survivors and to supporting further historical research.[555] This declaration prompted positive reactions but also criticism,[556] and whether these commitments have been fulfilled has been questioned.[557] Furthermore, the World Medical Association has yet to issue a statement or apologise for its persistent support for Hans-Joachim Sewering (a former President of the German Medical Association) to become its president in 1992, even after investigations revealed not only that Sewering was a former SS man, but that he had sent 14-year-old Babette Fröwis to her death.[558,559] Only after intense public criticism was Sewering's candidacy finally rescinded.

From silence to commemoration: recognition of victims

Although a culture of active commemoration and memorialisation of the Holocaust and other Nazi crimes

emerged in many countries soon after World War 2, the same did not occur with respect to medical crimes and their victims. After an initial phase of public scrutiny during the post-war trials, many in the German medical community opted to be silent. Things began to change in the 1980s, but most of the initial studies and public history activities focused on perpetrators. Victims, and their histories of suffering, became the focus of detailed research efforts only later, paving the way for commemorations that document their physical destruction and seek to reverse the erasure of victims' names, identities, and life stories.

In Germany, isolated attempts to draw public attention to the victims of the patient murders began in the 1980s, starting with a monument in a public space in Berlin.[560] Although this early effort gained little traction, others followed. In 2014, growing awareness of the roles of medical professionals in the euthanasia murders, new research, and an increasing focus on the identification of individual victims[561–563] led to the installation of a central memorial and information site at the former location of the T4 headquarters in Berlin. People with disabilities actively participate in official remembrance activities. The aims of these commemoration efforts, some of which involve innovative approaches such as collaboration with the performing arts, are to amplify the voices of victims and to support the reclamation of victims' history by representatives of the affected group.[564]

For decades, the names of people murdered in the so-called euthanasia programmes were kept secret because of rules around medical confidentiality and patient privacy, and the public identification of victims' names was hampered by archival laws in various countries. Such archival policies often seem to be rooted in long-held prejudices against people with intellectual or mental disabilities and have further increased stigma and exclusionary practices. However, historians persisted and, to an extent, succeeded in efforts to identify victims' full names. In Vienna, for example, the names of children killed in the Am Spiegelgrund hospital mark the graves in which the children's brains, obtained through autopsies and used by researchers for years after World War 2, were buried (panel 16).[567] Around 2010, medical historian Paul Weindling launched an international project aimed at documenting all victims of Nazi medical experiments. Weindling and his research team created a databank of their findings, which has been hosted by Leopoldina, the German National Academy of Sciences, since 2015.[568] Since 2017, a research project financed by the Max Planck Society has been investigating the history of collections of tissues from victims of Nazi persecution for brain research by the Kaiser Wilhelm Institute for Brain Research in Berlin and the Kaiser Wilhelm Institute for Psychiatry in Munich, and its various successors.[471]

Memorialisation of Nazis' medical atrocities is coupled with a worldwide effort to find and publicise as many victims' names and voices as possible, to make visible their suffering, fate, and dignity. Institutions such as Yad Vashem, the World Holocaust Remembrance Centre (Jerusalem, Israel), and the United States Holocaust Memorial Museum (Washington, DC, USA) collect and present specific information on the victims of the Holocaust, including those of Nazi medical crimes, in their permanent and travelling exhibitions.[569] Many

For an example of **collaboration with the performing arts** see https://www.andersartig-gedenken.de/startseite-es.html

Panel 16: Brains of victims of the child murder programme in Vienna

From 1940 to 1945, the Am Spiegelgrund institution in Vienna was one of the most important of a network of institutions where children were murdered under the so-called child euthanasia programme. As many as 789 children with developmental delays and various neurological conditions were killed at the clinic, most of them poisoned with barbiturates. During the children's stay at the facility, doctors collected comprehensive clinical data from them via observation and from invasive and painful examinations such as pneumoencephalographies. After their death, autopsies were done, and the children's brains and other body parts were removed and preserved for future research.

In the early 1950s, Heinrich Gross (1905–2005), one of the physicians involved in the killings, took control of the brain collection (figure 12) after attempts to bring him to justice had failed. The brain collection became the material basis for his notable career in neuropathology. In the subsequent decades, Gross published dozens of scientific papers about the Spiegelgrund children's brains, some of them with leading colleagues in the field.

In the mid-1970s, Gross used his influence as Austria's most prominent court expert in forensic psychiatry to silence Spiegelgrund survivor Friedrich Zawrel by declaring him a dangerous criminal, which resulted in Zawrel's being imprisoned for years. Although Gross faced public accusations for his Nazi past from the late 1970s, the Austrian justice system did not put him on trial for murder until 2000, when Gross managed to evade prosecution by pleading unfitness to stand trial.

The human remains from the Spiegelgrund victims—including hundreds of wet specimens and paraffin blocks, and thousands of microscopic slides—were buried in 2002 in an honorary grave at the Vienna Central Cemetery.[565–567]

Figure 12: **Collection of brains from child victims of the patient murder programme at Spiegelgrund, Vienna**
This image was taken in 2002, in a basement of the Otto Wagner Psychiatric Hospital (Vienna, Austria). Photo credit: Media Wien.

people worldwide observe Holocaust remembrance days, which provide opportunities to commemorate these victims and their lives.[570]

Part 3: Key implications for contemporary medicine and medical education

The history of medicine, Nazism, and the Holocaust is compelling, even though it often seems to defy understanding. Health professionals in Nazi Germany behaved so egregiously that it is tempting to position them as monsters—as so fundamentally different from today's professionals[571] that no lessons can be learned from their behaviours and beliefs. As this Commission shows, however, there are good reasons to rather view medical collaborators with the Nazi regime as people with specific professional beliefs, who—living in a distinct, extreme political system—pursued personal and career goals and shared psychological characteristics with the rest of humanity. Trying to understand these medical collaborators in this context, informed by a detailed historical analysis, can provide useful insights for both the present and the future of medicine.[572] Our use of this approach in no way means that we think individual perpetrators should be absolved from responsibility. Rather, these insights allow us to recognise potential dangers that are still relevant to medical professionals and their interactions in society today. Additionally, awareness of the history of medical involvement in Nazism can also help to avoid false or simplistic interpretations[573] and facilitate the recognition of common themes and patterns that connect this complex history with the present and the future.

The work of this Commission is predicated on the notion that an exploration of this history is of paramount importance precisely because health professionals' involvement in Nazism and the Holocaust has relevant implications for today. Learning from history does not follow a deterministic logic, and we do not claim that ours are the only reasonable conclusions that might be drawn from this past. Rather, what we are presenting in this part are the results of normative considerations of core medical issues with a focus on individual human rights, informed by the available historical evidence from a period that represents the absolute negation of these values and everything health professionals should stand for. Then, in part 4, we consider concrete examples of how knowledge of the history of medicine during Nazism can inform reflection and debate on contemporary problems in medicine.

Potential dangers inherent to modern medicine

The central insight from the history of medicine during Nazism and the Holocaust is that the atrocities health professionals committed represent, to a large degree, the outcome of corrupt moral agency in the face of potential dangers that are inherent to modern, scientific medicine as it emerged in the 19th century.

It took the specific political conditions of Nazi Germany to transform these potential dangers into the particularly radical manifestation we document in this Commission.[574,575] The features of the kind of medicine we focus on here developed in the mid-1800s, when medicine became both more scientific and more organised around institutions, which, in turn, were oriented towards the production and implementation of scientific knowledge.[576] With the so-called laboratory revolution, the attention of physicians shifted away from the patient as a sick person to the patient's malfunctioning body and biological processes, which were to be assessed in the laboratory.[577–580] The use of animal models of human diseases as a privileged method of medical research epitomised this development, but this emphasis neglected the psychological and social dimensions of disease processes and potential interventions.[581] At the same time, health care and research became increasingly organised by complex institutions, with a high degree of division of labour.[582–584] Although these developments and their underlying assumptions enabled rapid progress in the production of biomedical knowledge and highly efficacious therapeutic and preventive interventions for a broad range of medical conditions, they also resulted in physicians having less personal knowledge of individual patients, and were associated with increasingly fragmented and reductionist perspectives on the patients and their suffering.[585]

If no preventive steps are taken to counteract the potential dehumanisation of patients that is inherent in this type of medicine, there is an ever-present risk of medical injustices or—in some circumstances—medical infringements of patients' fundamental rights. These dangers are linked to factors including opportunities to abuse medical power, the tendency to objectify patients and research participants, dilemmas about split loyalties, and temptations to abandon basic values for ideological and opportunistic reasons.

The history of medicine, Nazism, and the Holocaust shows that health professionals—including those in positions associated with great status, wealth, and influence—can be vulnerable both to a professional propensity to prioritise the perceived collective interests of a community or population and to prioritise the advancement of science over the welfare of individual patients or research participants. In such instances, health professionals risk becoming political or ideological agents whose institutional responsibility or individual moral agency is distorted. Importantly, although the history of medicine during the Nazi regime provides examples of how these potential dangers can unfold, it also shows how such deterioration into unethical behaviours can be avoided.

Fragility of the core values and ethics of health care

The history of medical involvement in Nazism and the Holocaust shows that the core values and ethics of

health care are fragile and must constantly be protected, reinforced, and critically reassessed. This key point stems from the painful recognition that medical ethics and professionalism were not dismissed under the Nazi regime as fundamentally incompatible with the goals of Nazism. Rather, they were radically transformed in lockstep with broader developments in Nazi Germany, and turned into instruments of a brutal dictatorship and its eugenic and racist agenda. Norms and values shifted to the point that health professionals could persuade themselves that it was ethically justified to prioritise the purported interests of the *Volk*—conceived as the national body, and defined in biological and racist terms—above all else, even the most fundamental aspects of humanity.[586] In the context of the euthanasia murders, for example, the distortion of ethical norms went so far as to define the murder of the most vulnerable as not only acceptable, but as an imperative.[17,587]

Understanding this past can help to explain the priorities of today's health professional ethics. In confronting Nazi medical ethics—broadly defined as the prioritisation of the wellbeing of the *Volk* over the lives of individuals—and the resulting medical crimes committed, many health and legal professionals emerged from World War 2 with a renewed focus on their roles as advocates for the human rights of individual patients. These individuals formulated new guidance for research and practice, and even proposed specific professional obligations (based on concepts of universal human rights) to detect, address, and prevent medical war crimes.[588,589] Still, many other health professionals chose to ignore this history and its implications. Many former Nazi health-care professionals continued their careers and even held leading positions after the war in Germany, Austria, and internationally.[558] Furthermore, unethical human medical experiments, and massive infringements of reproductive and other health-related rights continued to affect vulnerable populations in many countries.[495,590–594]

Studying the corruption of German medical ethics during the Nazi period provides a unique possibility to explore the aims and limits of professional ethics. Such study provides the important insight that the ethics of health care are not universal, stable, and intrinsic to professional theory and practice. Rather, ethics are prone to change over time dependent on cultural, social, economic, and political factors, and particularly when put under pressure. Therefore, they constantly need to be critically assessed and reaffirmed to ensure that they stay aligned with core values specific to medicine—especially a commitment to safeguarding the health of individual patients. The goal should be to protect health-care ethics from potentially becoming exclusionary and inhumane. In this fashion, the core values in health care can serve as a balancing social force and potentially prevent society from moral failure provided that health professionals are properly fulfilling their roles.[595–597]

The importance of resistance and resilience

Courage, resistance, and resilience are needed to prevent and counteract potential abuses of trust, power, and authority in health care. Earning the trust of patients and the public, and ensuring that medical authority and power are not abused, require constant awareness, individual self-reflection, and building systems of mutual accountability. Power dynamics will always exist in health care in view of the potential vulnerability of sick people, and hubris is a constant risk, especially as medicine becomes increasingly effective. Consequently, building both moral resilience and humility among health professionals, and fostering skills and practice in advocacy, activism, speaking out, and standing up against abuses of power are critically important. Extreme forms of misconduct and abuse of power can be studied and analysed in the well documented context of medical involvement in Nazism and the Holocaust. At the same time, this history also provides remarkable examples of physicians' and other health professionals' resilience in the face of challenges, and resistance to temptations, pressure, and coercion.

The need to prioritise human rights

The pursuit of scientific knowledge in medicine should occur within a framework that prioritises individuals' human rights. Protecting and respecting human rights are primary obligations for health professionals, including those working to enhance scientific knowledge in medicine. There will always be differing interpretations of the precise meaning of specific rights and conflicts between different principles that might necessitate mediation (detailed exploration of these issues is beyond the scope of this Commission). However, all such interpretations centre around the core values of human dignity, autonomy, and equality.[598] Research in humans is inherently associated with potential conflicts between the production of new knowledge and the protection of potentially vulnerable 'subjects' of research. The Nazi era presents an extreme case in which the wellbeing of people compelled to participate in research was completely disregarded. Patients and prisoners in Nazi Germany were forced into painful, damaging, and often-deadly experiments—they were subjected to research in the true sense of the word. Terminology is important here—a person who voluntarily and freely consents to be experimented on is more appropriately called a research participant, not a research subject. Under conditions of informed consent and "the free power of choice" of the research participant,[599] the pursuit of knowledge through research on humans can be justified. As first formulated in an international context in the Nuremberg Code, human research for the benefit of humanity should only be done within the framework of respect for participants, with first priority given to respecting the human rights of dignity, autonomy, and equality for every individual human being.

This importance of the need for health-care professionals to prioritise human rights is reflected in the increased emphasis on including the topic as a core standard of professional values in education in many countries in the past several years.[600] Educational interventions specifically related to human rights have been proposed and need to be further implemented.[601] They can address problematic domains in health care and education—eg, the effect of antisemitism on health-care workers and patients, or more generally the gap between human rights and the reality of how patients' rights might be violated.[602] Overall, more work is needed to develop and disseminate an understanding of health-related and health-care-related human rights, including in the domain of public health, with an emphasis on the human-rights-related responsibilities of physicians and other health-care workers.[603]

Responsibilities in fighting antisemitism, racism, and other discrimination

A final key implication from the history of medical involvement in Nazism and the Holocaust is that health professionals have particular responsibilities to fight against antisemitism, racism, and all other forms of discrimination in the medical field and beyond. The fallacious practice of ascribing different values to individuals and groups of people according to physical, cultural, religious, or psychological characteristics, and defining these characteristics a priori as biological in nature, produced dire consequences in the Nazi era with the support of medical science and its representatives. Not surprisingly, such discriminatory practices in various forms are also a central feature in other instances of historical atrocities and mass violence, such as those perpetrated within the contexts of colonialism and slavery. To this day, such false beliefs continue to fuel antisemitism, anti-Black racism, discrimination against Roma, Sinti, and Travellers (antigypsyism),[604] sexism, and prejudice and hostility against other ethnic, sexual, and gender minorities (including migrant communities), and help to justify and normalise human rights violations. Emerging from the history of medicine, Nazism, and the Holocaust, however, is the insight that health professionals have particular roles in the fight against antisemitic and other racist fallacies, and in preventing and counteracting human rights violations including, in the most extreme cases, crimes against humanity, war crimes, and genocide.[605] Namely, health professionals have distinct credibility to challenge false scientific claims made by antisemites, racists, sexists, and other bigots, and they are in key positions to prevent, detect, document, or remedy certain human rights violations, such as torture and mistreatment in detention settings. In view of these specific abilities and opportunities, health professionals can and should act against individual and systemic bigotry, not only in health care, but also in educational and research settings. Curriculums need to address the specific biases in every society against individuals and groups categorised as essentially different or other, how such biases might affect any health-care professional's work, and how such perceptions can be changed through reflection on the historical evidence from medicine in Nazi Germany. This call to action extends into the political sphere, because it is especially necessary to sustain the provision of appropriate care to vulnerable populations, such as immigrants, other historically marginalised groups, and those in regions affected by war or conflict.

Antisemitism has a long history in most parts of the world, and it remains prevalent and ubiquitous, with recent escalations in many countries.[606,607] Antisemitism comes in many forms and reaches all levels of society.[608] It is experienced by many Jewish medical students[609] and faculty,[610] on university campuses,[611] and in health-care facilities.[607,612] Germany and Austria were not the only countries to exclude Jewish students from universities: similar approaches were employed in the health professions in other European nations, in North America, and elsewhere, including after 1945.[613,614] Antisemitism spans political and religious spectrums and emerges in relation to widely disparate issues, from global economic crises to Russia's war on Ukraine and the COVID-19 pandemic.[615,616] A distinct aspect of antisemitism is the preponderance of paranoid conspiracy beliefs and ideation that ascribes pernicious and pervasive global influence to Jews. As a result, societal crises often lead to the resurrection of ancient yet persistent antisemitic myths.[617] Poor knowledge of history and the purposeful denial of the historic facts of Nazism and the Holocaust can produce bizarre and harmful accusations. For example, during the COVID-19 pandemic, prominent Jewish and non-Jewish doctors and scientists who promoted vaccination campaigns were targeted with antisemitic and Holocaust-distorting attacks that compared these global health leaders to Nazi medical experimenters.[618,619]

Health-care professionals with knowledge of the history of medicine, Nazism, and the Holocaust understand the scientific baselessness and the dangerous potential of antisemitism, meaning they can play important roles in speaking up against antisemitic falsehoods and hate. Similarly, institutional leaders who understand this history have crucial responsibilities to fulfil in this context, as exemplified by statements from the editors of *Nature* in 2018,[620] the Editor-in-Chief of *The Lancet* in 2019,[1] and the President of Harvard University in 2021.[621]

The adverse effects of racism in health care are now widely recognised (panel 17).[634] In the USA and some other countries, these effects tend to be addressed through the establishment of diversity, equity, and inclusion initiatives. Such initiatives aim to counteract any discrimination on the basis of race, gender, sexual orientation, age, and ability, but often overlook the

interplay of antisemitism and racism, not only that experienced by students and health-care professionals but also its effects on patients.[635] In the 2023 paper "The US national strategy to counter antisemitism", US President Joe Biden called for the inclusion of antisemitism in diversity, equity, and inclusion curriculums.[607] However, to more effectively include antisemitism in efforts to fight discrimination, more research is needed to understand why antisemitism sometimes seems to be excluded from analyses of the power imbalances that lead to various forms of discrimination in society (eg, some of the scholarship on intersectionality).[636] Racism in health care does not only affect ethnic minorities: it affects the wellbeing of all learners, teachers, and patients.[637] It stands to reason that the same is also true for the effects of antisemitism.

Nazi Germany was not the first antisemitic and racist regime. Histories of colonialism, apartheid, slavery, and wars abound, with dominant powers using various rationales to discriminate against minorities labelled as inferior.[638] All these histories are abhorrent and violent. Still, there are important differences. Never before in history had an explicit state policy targeted an entire people—men, women, and children, old and young, healthy and infirm—for annihilation wherever they could track them down, and justified this policy partly by using biology and medical science. In Nazi Germany, antisemitic beliefs and stereotypes were portrayed as being grounded in biological science, allowing for the long-standing pervasive antisemitism and racism within much of the German medical community to become driving factors in defining health policies.[35,123] Health professionals had the expertise, tools, willingness, and often even eagerness, to take the lead in supporting Nazi policies related to so-called racial purification.[587]

An important aspect of this past for contemporary medicine is that, despite the understanding of race as a social construct rather than an immutable biological fact, medical racism still exists.[634] Medical racism is expressed not only in individuals' open bigotry and cruelty against racial and ethnic minorities, but also in subtle microaggressions and stereotypes held by people who would not consider themselves to be racist. Furthermore, systemic racism remains embedded in medical institutions and policies.[639] However, there is still little evidence for the effectiveness of any specific intervention in addressing the complexities of this issue.[640] Societies worldwide continue to grapple with antisemitism as a persistent and specific form of racism and religious intolerance.

Learning about medical involvement in Nazism and the Holocaust can afford insights into the intersectional dimensions of medical discrimination and how biases can amplify each other with murderous outcomes. This history can shed light on contemporary incidents of medical malfeasance, and on discrimination against health-care professionals and patients. Reflection on these connections can help to foster moral courage for speaking up in the face of antisemitism and any other form of racism within clinical and academic settings, medical schools, and in academic publishing.

Part 4: Specific implications for contemporary health care

The involvement of health professionals in atrocities under the Nazi regime has had a substantial influence on modern health-care ethics. The origins of many major professional ethical guidelines are linked to this history, and, after decades of widespread silence on the topic,[502,586,641] many of today's bioethical debates are explicitly or implicitly informed by it.[481,501,642] The implications of the history of medicine under the Nazi regime for contemporary debates concerning different domains of health care, public health, and beyond are far reaching.[643] In this section, we explore some of them in further detail. These examples are not exhaustive, but show how knowledge of the history of

Panel 17: The contemporary fight against antisemitism and racism in medicine

The COVID-19 pandemic has made apparent the tragic consequences of long-standing health disparities and systemic racism in many societies,[622] including racial disparities in access to health care and COVID-19-related deaths in high-income countries in North America and Europe.[623] These revelations have spurred health professionals' institutions to start addressing these wrongs more actively on several levels. The number and breadth of activities in the pursuit of an anti-racist future are finally increasing.[624] For example, diversity, equity, and inclusion policies and requirements have increasingly been formulated and implemented.[625] Professional groups of people of colour are forming, new research is exploring the medical effects of racism,[626] clinical training and practice are changing,[627] professional associations have started to scrutinise their past implication in scientific racism,[628,629] and legacies of colonialism, such as egregious health disparities disadvantaging Indigenous populations, are finally being acknowledged.[630] At the same time, there is criticism that a prevalent perception of race primarily in terms of skin colour has tended to render "the anti-semitism that led to the Holocaust illegible in the USA".[631] There are numerous direct connections between antisemitism, racism, and race policies in Nazi Germany and in the USA in the early 20th century—including US laws and policies around both eugenics and racial exclusion that served as examples for eventual Nazi race and eugenics policies.[632] Medical professionals who learn about this history and these connections will recognise that antisemitism and other forms of racism are often entwined. Therefore it is important to include antisemitism in discussions and learning about diversity, equity, and inclusion, not least to combat antisemitism on academic campuses.[633]

For an example of such a **professional group** see https://www.blackinanatomy.com/

Panel 18: **Eugenics in the 21st century**

Eugenics continues to influence debates in medical and public health ethics, in which it is often referred to as new eugenics or neo-eugenics. These terms are used to distinguish contemporary debates with eugenic overtones from those of the past, and are applied to a range of interventions, from new molecular technologies for gene modification to assisted reproductive choices. Conceptually, the primary difference between neo-eugenics and the eugenics of the past is the focus on individual health and choice without explicit governmental intervention in the former compared with the emphasis on the interests of the collective imposed via overt governmental intervention or even coercion in the latter.

Concerns about neo-eugenics include the argument that the use of assisted reproductive technologies, selective implantation of embryos, and abortions in this context, could constitute the first step towards state-coerced selection of births. Other apprehensions arise not from fear of overt state involvement, but concerns about the consequences of social stigmatisation following individual choices.[648–653] In this context, the role of genetic counselling is particularly important. Partly in reaction to the history of eugenics, counsellors are expressly taught to be non-directive, emphasise personal or parental choice, and question the use and abuse of personal genetic information.[653,654] However, emphasising individual choice alone might not avoid eugenic implications for a community, such as a decrease in the number of children born with conditions requiring specialised care and resources, especially if social resources for their care are not provided.

In discussing neo-eugenics, references to the history of medical involvement in Nazism can be both helpful and potentially distracting, because modern patient-centred practices have almost nothing in common with the key features that rendered Nazi eugenics clearly unethical (ie, coercion, violation of reproductive freedoms, state control, overt antisemitism, racism, and explicit denigration of disability). These differences between the past and the present are important to acknowledge, even as the history of eugenics and National Socialism is recognised as undeniably related to contemporary debates,[655] including ethical inquiries around state and private sector funding for reproductive technologies, prenatal testing, and abortion in this context, and the role of cost–benefit analyses in deciding when to do prenatal screening.[656] The tension between the fundamental right to abortion as part of self-determination and worries about eugenically motivated selection of human life based on prenatal screening makes this one of the most contentious ethical issues.[647,657]

medicine, Nazism, and the Holocaust is essential for contemporary discussions in medicine and society.

Eugenics

Eugenic scientific theories have been used to create, justify, and increase inequalities between individuals and groups. Although there were prominent eugenicists who believed race was irrelevant to so-called genetic fitness, eugenics and racism were tightly connected in practice, as evidenced by Germany's use of race hygiene as synonymous to eugenics. Racial value hierarchies combined with eugenic theories have served—not only in Germany—as justification to stigmatise, dehumanise, discriminate against, and forcibly sterilise people considered to be racially or genetically inferior and therefore perceived as a threat to the health and prosperity of the community or nation. Importantly, eugenics purported to offer scientific explanations for alleged societal ills and possible solutions to these issues. Scientific racism—ie, the belief that biology and genetics explain all or almost all differences in educational success, economic advancement, and other markers of status between racially defined groups—was clearly connected to eugenic theories, and it still informs the rhetoric of far-right politics in many countries.[644] Policies of state-controlled reproduction are still enforced to varying degrees around the world, including forced sterilisation as a negative eugenic measure.[645–647] In addition, a debate has arisen focused on a 'new' or 'neo-eugenics' in connection with technology-enabled reproductive choices in the 21st century (panel 18).

Knowledge of this history of eugenics can stimulate proactive work by health professionals to counter eugenic thinking and scientific racism. Recognition of the extent of the once widespread international belief in eugenics, including from many prominent figures in medicine and science, should serve as a reminder that scientific theories are potentially fallible, and so are the policy prescriptions derived from them. In response to this chapter in history, an interdisciplinary anti-eugenics movement has emerged among historians, scientists, and health-care professionals, with the stated goal of "working for a future where each person is equally valued, with robust commitments to social justice and human rights that will allow all to flourish".[658]

Eugenic theory and practice in Nazi Germany included discrimination (and ultimately campaigns of mass murder) against people with psychiatric illnesses or physical, mental, cognitive, and developmental disabilities. Despite the high numbers of people with disabilities globally, stigma persists. People with disabilities are disproportionately poorer than people without disabilities and have historically experienced many forms of social exclusion, including those perpetrated by health professionals.[659] To counter the negative consequences of the tendency to medicalise diverse human experiences, on the basis of lessons from history, diversity, equity, and inclusion initiatives should also include people with disabilities.[660] Such initiatives aim to end all forms of stigma and discrimination, and could help to draw attention to implicit biases, microaggressions, and overt hostility against people with disabilities.[661]

Euthanasia

In the field of medical ethics, the Nazi patient murders are often referred to in debates around end-of-life care.[502,662] All too often, this discourse conflates these Nazi murders with the contemporary practice of euthanasia.[663] During the Nazi period, when health professionals actively killed patients deemed unworthy of living, the term euthanasia was cynically used to provide cover for mass murder. Contemporarily, euthanasia is frequently understood as the provision of assistance by health professionals to patients seeking to hasten their death, although the term involuntary euthanasia is also used to describe ending the lives of newborns with severe congenital conditions or of

patients in a persistent comatose state, people who cannot explicitly ask for such a termination.[664,665] Contemporary euthanasia laws, practices, and terminology are in flux and differ from country to country. The Netherlands became the first country to officially legalise euthanasia in 2001, followed by Belgium and others.[664–669]

The state-sanctioned murder of patients under the Nazi regime differs in important ways from individuals seeking medical advice and assistance to help end their life in situations in which they see no other option. Nevertheless, economic and societal factors continue to play a role in end-of-life decisions today. One motive linking the patient murders of the Nazi period with contemporary euthanasia is the assumption that the individuals concerned have lost the quality or value of life. Such judgments, of course, are highly dependent on shifting medical, societal, and cultural assessments of human disease, suffering, and disability. Thus, despite key differences, studying the history of euthanasia debates in Nazi Germany and earlier can help to elucidate present day complexities.[670]

Debates about the justification and legitimacy of killing those whose lives were allegedly "unworthy of living"[175] had begun in the late 19th century, but thrived in the unstable economic conditions of 1920s Germany. The arguments made included patient autonomy (ie, the alleged wish of individuals with certain conditions to die), the alleged psychological and economic burden that these patients represented for their families and society more broadly, and a professed—if often questionable—compassion for the individual in question. This history can serve as background for critical examination of the multiple facets of contemporary euthanasia debates, including the ostensible role of compassion among health professionals in these decisions, and the extent to which people asking for medical aid in dying have true free will, given potential underlying economic and other societal factors. Similarly, however, others might question whether the state should deny mentally competent people the right to access medical assistance in dying should they seek it, especially because state control over individual health decisions was a hallmark of medicine under the Nazi regime.

These complexities belie the simplistic assumption that any form of euthanasia is tantamount to a step towards Nazi-style practices. In educational settings, there are many possibilities for initiating these challenging conversations when learning about the patient murders in the Nazi era. Such discussions include the exploration of how and why Nazi health professionals used the term euthanasia to describe secret programmes of patient murder, and extend to the role of psychiatry and its practitioners in dealing with vulnerable populations during and after World War 2 (panel 19).

Health professionals' capacity to harm patients

Physicians and other health professionals in Nazi Germany caused great harm to many of their

Panel 19: Psychiatry, Nazi patient murders, and vulnerable populations

Although antisemitism was a major driving force behind the murder of Jewish patients in psychiatric facilities during World War 2, the so-called euthanasia murders were to a large extent motivated by the idea of a healthy, prospering national community—a goal that contained important economic elements. Psychiatric patients (who at the time included people with disabilities of various types) were stigmatised in Nazi Germany, and to this day remain among the most vulnerable groups in society. The history of the medical mass killings in Nazi Germany shows the specific risk to the most vulnerable patients when support is no longer provided by social and health-care systems or the professionals charged with caring for them. It is essential, even in societies with comprehensive social support systems, to actively ensure that health professionals serve as defenders of patients with psychiatric illnesses or disabilities, especially in extreme cases such as the COVID-19 pandemic[671] or Russia's war in Ukraine,[672] in which such patients are especially vulnerable.

Further implications from this history emerge from studying individual medical professionals and their actions. Leading psychiatrists in Nazi Germany pursued a goal of transforming their long-term psychiatric institutions—which housed people considered incurable and unfit to work—into modern, active healing facilities by callously promoting and participating in the murder of chronically ill patients. In doing so, the psychiatrists hoped to improve the status of their discipline within medicine and in society, and to emphasise psychiatry's role in active research and healing.[218–220] The actions of these physicians clearly show the destructive potential of pursuing professional advancement and status as primary goals.

Additional implications can be drawn from the fact that many psychiatrists involved in patient murders in Nazi Germany continued to practice after 1945. The failure to confront past grave misconduct and the implicit tolerance or acceptance of these atrocities by health professionals in psychiatry and other medical disciplines is a further indication that the patient murders in Nazi Germany were not exclusively dictated by politicians outside the medical profession, but rather were supported from within the medical field.[128,221] Although these psychiatrists no longer engaged in patient murder, their professional values and attitudes often reflected their Nazi past.[128,221] This history thus provides powerful opportunities to reflect on challenges related to professional self-regulation in the health professions. Students can explore why this profound failure of self-regulation arose, and perhaps compare it with other examples of professionals closing ranks to shield each other from being held to accountability and consider how to prevent such behaviours from happening again.

Panel 20: The Milgram and Zimbardo experiments

Scholars have designed and implemented experiments aimed at elucidating the human propensity to inflict harm on others within the contexts of hierarchy and obedience in an inquiry into the behaviours of Holocaust perpetrators.[572,673–677] The most prominent of these experiments were overseen by Stanley Milgram (Yale University, New Haven, CT, USA) and Philip Zimbardo (Stanford University, Stanford, CA, USA). In the so-called Milgram experiment in 1961–62, participants were told to administer what they believed to be electric shocks of increasing intensity to actors who pretended to suffer as a result of these shocks.[675] In Zimbardo's experiment, known as the Stanford Prison Experiment, participants were divided at the outset into groups of guards and prisoners, and the guards displayed increasingly violent behaviour towards the prisoners.[674] These experiments have been extensively quoted and popularised for ostensibly showing that most human beings have the capacity to become perpetrators of harm under specific circumstances,[572,588,673,676–678] and have been replicated in various forms, with generally similar results.[679–682] For example, in an experiment[683] in which nurses were ordered by physicians to administer a drug overdose, most nurses complied with the order at least sometimes. Nursing scholars attributed this behaviour to the diffusion of responsibility, with the nurse attributing the responsibility to the physician, and urge awareness of this danger as a preventive measure in nursing care.[684]

The scientific merit and ethics of the Milgram and Zimbardo studies have been heavily scrutinised and remain controversial.[588,685–688] The conclusions that obedience to hierarchy and a basic human propensity for abuse of power explain the behaviours recorded in the studies have also been questioned, and alternative interpretations have been suggested—eg, that participants were not so much motivated by unquestioning obedience but rather by a willingness to continue an experiment to support its scientific goals coupled with wanting to conform with expectations (so-called engaged followership).[595,679,681,682,686–689] In view of the frequent discussion of the Milgram and Zimbardo studies in the context of medical involvement in Nazism and the Holocaust, educators should be aware of the complex and unresolved controversy around these studies.

patients. Any attempt to explain this behaviour should incorporate a detailed analysis of the interactions between medical and political actors and institutions. Indeed, individual choices were influenced not only by the specific political circumstances of the Nazi regime, but also by structural, sociological, and cultural factors not unique to this era. Analytic approaches should consider the psychological, societal, political, economic, and professional factors that collectively produce the spectrum of potential outcomes in medicine, from healing to harming.[575] Early attempts to explain Nazi medical crimes often focused on the psychology of individual perpetrators in specific environments that were conducive to violence. The Milgram electric-shock experiment in the 1960s and the Zimbardo experiment (ie, the Stanford Prison Experiment) in the 1970s, for instance, were presented as proof that most people can become perpetrators of violence in specific circumstances (panel 20). Although they have been criticised for their ethics and methods, these experiments' basic findings make a strong case that most human beings have the capacity to commit atrocities. Within the domain of medicine, relevant predisposing factors include the roles of hierarchy, obedience, conformity, and what has been conceptualised as engaged followership.[673,685]

A layered psychoanalytic approach to understanding Nazi medical crimes was proposed by psychiatrists Robert Lifton[397] and Michael Grodin,[588] who posit factors that facilitate atrocities on three different levels. First, they discuss the psychology of individual perpetrators, with mechanisms including dehumanisation of patients, numbing of empathy, and illusions of omnipotence. Notably, some of these processes can arise as a result of necessary mechanisms in medical practice. The distancing needed to neutrally observe and then treat patients, for example, could also lead to dehumanisation in other contexts (panel 21). Second, Lifton and Grodin consider the psychology of groups of perpetrators and suggest that mechanisms such as traditional obedience to authority, diffusion of responsibility, peer pressure, and a shared sense of unique superiority played important roles.[263] The third level relates to the specific economic and social contexts of interwar Germany that facilitated atrocities.

Crucially, this history also shows that, despite all the factors mentioned, health-care professionals in the Nazi era had agency. A range of behaviours remained available to them, and while some health-care professionals assumed leading roles in mass murder, others quietly declined to recommend patients for forced sterilisation or worse, or pursued active resistance against the regime.[575] In this sense, as historian Dan Michman notes, "Medicine serves as a prism through which we can gain a deeper insight into the nature of Nazi antisemitism as well as into the different moral paths that were chosen by practitioners of the same profession".[587]

Although hopefully a similar constellation of events will never occur again, medical care continues to involve aggressive acts in the service of healing. How should the power gradient of the physician–patient relationship be monitored and regulated? How should temptations in medicine—be they of a financial, academic, or political nature—be managed? What are the potential roles for professionals in standing up to authoritarian political movements that build on popular socioeconomic discontent?

With regards to psychology, this history suggests it could be beneficial to promote reflective practice in medical

Panel 21: Dehumanisation in medicine

Medical dehumanisation did not begin with the Nazis, nor did it end with their fall. However, reflecting on physicians' behaviour in Nazi Germany can increase professional vigilance about the pervasive potential for dehumanisation in health care and raise awareness of the dangers associated with loss of compassion and empathy. Dehumanisation can start with the process of establishing professional distance, which is necessary for clinicians to objectively question, observe, and treat patients. However, this distance can potentially transform into dehumanisation when it is not balanced with the cultivation of empathy for patients, especially in stressful situations.[690]

Explicit, intentional dehumanisation was commonly used by the Nazi regime, which often portrayed people with disabilities, Jews, and other groups as parasites, vermin, or pathogens. Nazi health professionals endorsed and acted on this type of dehumanisation on a wide scale. They infused antisemitic and racist theories of genetic inferiority into daily health practices, and treated some patient groups as though they posed an actual danger to the community.[691] Medical dehumanisation enabled Nazi health professionals to forcibly sterilise people with disabilities and alleged genetic defects, to perform cruel and often deadly experiments, and to murder patients in the so-called euthanasia programmes, with antisemitism justifying the particular dehumanisation of Jewish patients.

Dehumanisation in medicine can still undermine or negate the human rights and dignity of marginalised people and their inherent worth, which is independent of race, sex, gender, class, status, or ability. The concept of human dignity, although contested,[692] is included in the UN's Universal Declaration of Human Rights and was adopted after World War 2 in explicit response to Nazi human rights violations. It has also been embraced by international bodies such as the Council of Europe, and serves as an anchor for international bioethical frameworks and conventions. In 2008, the US President's Council on Bioethics called human dignity the "essential inviolable core of our humanity".[693] In an ideal diverse global community, human dignity is connected to the concept of fundamental human rights, which serve as an important ethical baseline for health policy beyond religion, culture, or philosophy.[694]

Reflection upon, and engagement with, the history of medicine, Nazism, and the Holocaust can inform bioethical debates[695] related to questions of dehumanisation and human dignity. The denial of the right to personal and bodily autonomy is the fundamental characteristic of acts of dehumanisation, and examples are as varied as the lived realities and belief systems around the world. Importantly, awareness of health professionals' practice of dehumanisation in Nazi Germany, and the resulting deadly outcomes, can strengthen awareness among health professionals about the erosion of empathy, compassion, and moral conduct, which can lead to dehumanisation. In this sense, "reengagement with the horrors of the Holocaust can supplement and motivate a critical, real-world bioethics, one that is responsive to the personal and institutional failures of our time, and which provides practical guidance under non-ideal conditions".[695]

education and clinical work, to consider power differentials in professional relations, and to have open discussions about when and how it might become necessary for health professionals as individuals and collectively to act against authority and to stand up to power.[696]

Health professionals standing up to power

As much as the history of healers becoming killers in Nazi Germany has contemporary implications, so do narratives of health professionals who refused to yield to the Nazi regime, especially for the sake of their patients. A thorough analysis of the factors and conditions that allowed some health professionals to resist Nazi oppression should consider psychological, societal, and political factors, in conjunction with an understanding of medicine as it was practised in this specific historical context.

Although there are anecdotal case studies of resisters in Nazi Germany, few systematic studies have been done of the psychology of these people, especially compared with the substantial number of psychological studies of Nazi perpetrators. Still, resistance was one of the ways in which many Jewish and some non-Jewish health professionals coped with adversity, despite often having very little room to manoeuvre. These individuals showed moral courage, and exploring the contexts in which their moral courage manifested can provide valuable insights.

There are accounts of what has been termed Jewish medical resistance, instances in which doctors, nurses, and other health-care professionals in the ghettos and camps worked to preserve the dignity of human life despite impossible conditions, sometimes risking their lives and those of their loved ones in the process.[307,697] Some worked alone; others, such as the groups responsible for the hunger study in the Warsaw ghetto and the clandestine medical and nursing schools, were organised collectively. These Jewish practitioners—supported by a few non-Jewish colleagues—sustained a patient-focused practice for their fellow prisoners in line with that which had been pursued within the Jewish public health systems during the interwar years (eg, in Poland), at a time when no other health-care facilities would take into account Jewish dietary rules and other religious requirements.[322,324,698] Jewish health professionals confined in the ghettos and camps, and some non-Jewish camp prisoners who were also health professionals, often faced incredibly difficult choices or were forced to behave in ways contradictory to their personal and professional convictions. In these situations, some of them sought religious and ethical

guidance from rabbis and other community leaders, who sometimes helped in making these choices.[385,386,699]

There were also, albeit fewer, non-Jewish health professionals who stood up to the Nazi authorities (panel 22). Resistance manifested in various forms. The best known example are the medical students of the White Rose resistance group, whose opposition was motivated by the atrocities they witnessed on the Eastern Front.[705] Additionally, some health professionals refused to report their patients to the T4 programme,[218,706] and others harboured and treated persecuted patients.[704]

Contemporary health professionals might rarely or never face similarly challenging situations, but given wars, political radicalisation, pandemics and natural disasters globally, many will encounter circumstances that challenge their consciences and ethical principles. Many health professionals will also feel pressure—from the state, an employer, a superior, or others—to compromise the safety and wellbeing of their patients.

An important implication from the history of medical resistance during the Nazi period is that health professionals need to foster capacity for questioning the authority of any institution or regime that endangers public health, the health of particular groups, the health of individual patients, or their ability to care for patients. When such acute perils arise, health professionals might need to use their scope of action for resistance (eg, by speaking out on behalf of a patient), to ensure that patient health is not compromised and that their own integrity and wellbeing are not damaged.[707] In certain dire situations, medical professional civil disobedience might be necessary.[708] This stance of courage,[709] critical reflection, questioning of authorities, and willingness to stand up against authorities needs to be part of medical education,[710] and the history of medicine, Nazism, and the Holocaust can catalyse such discussions.

Panel 22: Two Righteous Among the Nations

Edward Loth (1886–1944)

Edward Loth was an unlikely rescuer of Jews. Trained as an anatomist and anthropologist, he was a proponent of eugenics and published studies in racial anthropology. He served in the Polish Army during World War 1 and established a department of orthopaedics at Warsaw University (Warsaw, Poland). As a professor of anatomy in the interwar period, he argued for a restrictive admission quota for Jewish students to medical school, and he demanded that Jewish students find bodies from their own religious community for their anatomical education. However, although known as an antisemite, he did not tolerate any violence against Jewish students. Under Nazi occupation, he served in the Polish Home Army and taught in and supported the clandestine medical school of Warsaw University in the Warsaw ghetto. He also provided shelter and medical care to many of the persecuted, thereby risking his own life. When his student, Ludwik Sztabholz, escaped from Warsaw ghetto in 1943, Loth protected him from detection by the Nazis. When Sztabholz asked Loth about his apparent change in behaviour towards Jews, Loth explained that he considered the Nazis' persecution of Jews as a crime, and that he would fight against this with all his might.

Loth was killed in a German bombing raid during the Warsaw Uprising in 1944. In 1996, on the basis of the testimony of Sztabholz, Loth was recognised by Yad Vashem (the World Holocaust Remembrance Center, Jerusalem, Israel) as a Righteous Among the Nations—a title used to honour non-Jews, who, during the Holocaust, sought to save Jewish people, even at the cost of their own life.[323,700–702]

Albrecht Tietze (1901–68)

Albrecht Tietze was the son of a well known surgeon in Breslau in Germany (today Wrocław, Poland), and worked as an internist at a hospital in Berlin. He was one of the very few German physicians who protested against his Jewish colleagues' dismissal in 1933. During World War 2, he used his position in the hospital to shelter members of the German resistance who were under his care. He provided them with false diagnoses and kept them on his wards as long as possible to protect them from imprisonment. Tietze was recognized as a Righteous Among the Nations in 1970.[703,704]

Research on humans

During the Nazi regime, physicians and medical scientists deployed various justifications for their coercive and brutal research on human beings. These justifications included that there were pressing medical problems that needed to be addressed, the scientific validity of the research, the fact that the victims were going to die anyway, the benefits to be gained for many as a result of the suffering of a few, a scientific duty to exploit access to abundant humans who could not refuse to participate in research, and the need to help German soldiers and win the war. Irrespective of whether they thought the people they forcibly experimented on were criminals or racially inferior, the experimenters simply did not care about their victims' humanity. They separated the role of researcher from the role of a physician caring for patients. They claimed that in research, "the purity of the method…was the [only] prerequisite for the compliance with ethics norms" (translated by SH).[711] Hence, they saw the availability of victims and their bodies, both living and dead, as a research opportunity, with no concern for human welfare or dignity.[712] In the scheme of their scientific reasoning, the extreme cruelty of their methods and the unbearable suffering of their victims were deemed irrelevant.[713]

Implications from this history have shaped modern research ethics[480] and bioethics, which are centred on participants' right to voluntary informed consent and respect for personal autonomy.[714] However, as discussed previously, the initially strong standards oriented around informed consent in the Nuremberg Code were largely ignored and later diluted in international guidance documents such as the Declaration of Helsinki under pressure from within the medical profession and also the pharmaceutical industry.[479] Although most researchers today are unlikely to commit extreme violations of research ethics like those perpetrated by physicians in Nazi Germany, temptations and incentives to take advantage of vulnerable research participants remain common. Some medical professionals continue to be involved in the care of wartime prisoners and detainees, which can lead to extreme conflicts of loyalty. Knowledge of, and reflection on, the history of rationalisations used

in the Nazi era could prove useful in analyses of how similar arguments are used or misused contemporarily.[715]

Another contemporary debate for which the history of Nazi human research has ramifications concerns the concept of so-called broad or general consent for the storage, maintenance, and secondary research use of personal information or identifiable biospecimens in health data repositories and biobanks. Such repositories—reservoirs of extensive information—often ask participants to provide data and specimens for use in perpetuity by unlimited numbers of scientists for unspecified research. The concept of broad consent provides flexibility for researchers, which was not possible under previous informed consent models. The concept of broad consent is often justified by referencing the potential benefits of the research it facilitates, the ethical notion of reciprocity (which argues that people who benefit from medical advances have some obligation to also contribute to those advances), and the low risk of harm to the person making the donation. Because in most cases specific information is not provided about future uses of the samples, broad consent cannot be fully autonomous, which thereby weakens the requirements of informed consent. Knowledge of research practices in the Nazi context, and awareness of the implications of the potential misuse of health data and biospecimens for unintended ends, as well as the related incentives and temptations, can inform debates about the necessity and nature of regulations on the related issues.[716,717]

Despite institutional review boards, which are intended to function as ethical control agencies, unethical research in vulnerable populations is still done—often in neo-colonial settings, where research prohibited in countries with strong ethical control agencies is transferred to those with weak ones.[718] New approaches are needed to uncover and prevent such experimentation.[719] The full implementation of guidelines needs to be monitored, from the first approval of a study by an ethics commission and throughout the full course of the research until publication of the results. Researchers should be aware of the potential dangers of ethical misconduct in any experimentation with human participants, and should be informed by knowledge of past abuses in this context. Finally, novel research ethics issues will continue to arise, such as those posed by generative artificial intelligence, and knowledge of this history will continue to provide important context for future debates.[720]

Competing loyalties

The 2022 version of the World Medical Association International Code of Medical Ethics states that the "primary duty of the physician is to promote the health and well-being of individual patients by providing competent, timely, and compassionate care in accordance with good medical practice and professionalism".[497] However, there are situations in which this general guidance cannot resolve a dilemma—eg, when a health professional has competing obligations to several patients or obligations to parties other than individual patients, including the larger community, or an employer or the state. There could even be situations in which comprehensive patient care is in conflict with a health professional's duties to their family or their own wellbeing. Such cases can be complex, and useful resources are available to assist in managing them.[721–725] Education about how to manage such competing loyalties can be greatly supported by examining the extreme example of health professionals in Nazi Germany, who came to believe service to the German *Volk* and the state (rather than to their patients) was their primary responsibility.

The classic competing loyalty dilemmas are in military medicine, when conflicts can arise between duties to particular patients, orders from commanding officers, and the duty to adhere to military rules, regulations, and operational needs.[726] A military physician might be pressed by superior officers to prioritise care of their unit's casualties over enemy and civilian casualties, for example. Conflict might also result from a request to make a clinical judgment on a soldier's fitness, especially when that soldier could be either exaggerating a medical complaint to avoid returning to duty or minimising a problem to accelerate their return to duty.[727] The most extreme medical atrocities perpetrated by physicians in Nazi Germany included the direct involvement of military health professionals in torture and state-sanctioned murder.[394] Torture and capital punishment are still carried out by or with the support of health professionals under state orders (panel 23).[736]

Learning about, and reflecting on, competing medical loyalties in the Nazi era might thus seem to be of particular value for military health professionals,[737] but they are equally relevant in the civilian sector.[738] Any clinician might be pressured to act as an agent of the state,[739–741] and employed physicians—whether working for the state or for private entities—often receive instructions on how to handle clinical decisions, such as which medications to prioritise and which referrals to provide.[742] Self-employed physicians, meanwhile, might be tempted to provide marginal or unnecessary services or charge inflated fees to increase profits, or by other economic conflicts of interest.

However, reflection on this specific aspect of history of medicine in the Nazi era is associated with potential pitfalls. For instance, in post-war debates in the USA about so-called socialised medicine or universal health care, inappropriate claims were made that the Nazis implemented a socialised system of health care,[743,744] a claim that continues to be made[745] and reflects either a glaring lack of historical knowledge or a cynical use of a Nazi analogy to mislead people. The argument often relies on misrepresenting the "National Socialism" in the official name of the Nazi Party as proof of some kind of equivalence between an extreme right-wing, fascist

Panel 23: Health professionals and torture

Torture is practised in many countries and was even described as a necessary evil during the so-called War on Terrorism.[728] When physicians and psychologists were asked to assist in improving the US military's interrogation programmes, they collected data on the effectiveness of various interrogation techniques, including methods amounting to torture.[729] Debates arose not only around the ethics of such research, but also around whether the health-care professionals involved had a physician–patient relationship with the detainees subjected to torture, and whether, if such a relationship was absent, the health-care professionals could ethically participate in such interrogations.[729]

Torture usually takes place in prisons and detention centres, and thus health professionals working in these settings are most likely to encounter it and to have to choose whether to participate or to resist.[730,731] Rationalisations for participating in torture include belief in the effectiveness of torture as an interrogation method, workplace loyalty, and coercion. Religious, ideological, and nationalist beliefs are often cited as further factors, and, in some cases, sadism could play a role.[732] Irrespective of the justification, the involvement of health professionals in torture, in whatever form and to whatever extent, is a violation of professional ethics. Numerous national and international human rights standards expressly state that participation in torture is a contravention of medical ethics, including those of the World Medical Association, which was established during the Nuremberg trials and subsequently codified its opposition to torture in the Declaration of Tokyo (1975). The Declaration of Tokyo urges doctors "even under threat" to use their skills only for healing and comfort.[733] Many health professional organisations have since taken a clear stance against torture and adopted this declaration.

Health professionals in military and detention settings are often in a unique position to prevent or intervene to stop torture. Because victims of torture often need medical attention inside or outside their place of detention, health professionals are frequently the first to detect the physical and mental signs and symptoms of torture, especially if they are trained appropriately.[734] However, these individual health professionals cannot stand alone against the pressure to collaborate in torture—the community of health professionals needs to stand ready to provide help and support in upholding professional ethics.[735]

ideology (Nazism) and the modern political left. In fact, socialists and communists were among the first people arrested and imprisoned by the nascent Nazi regime.[155] Nazi health policies relied on discrimination, exclusion, and persecution on racial and other grounds, catering only to so-called Aryans and able-bodied people—ie, it was the opposite of universal. Reference to Nazi Germany in debates about health-care systems requires precise historical knowledge and careful argumentation.

Other important examples of health professionals acting as agents of the state include the psychiatric labelling and internment of political dissidents in the former USSR,[740] health professionals enforcing China's former one child policy,[741] surgeons carrying out punitive amputations in some Islamic countries that implement a strict penal code within Sharia law,[746] lethal injections administered by physicians to execute prisoners in the USA,[739] and health professionals' participating in the force-feeding of prisoners on hunger strike.[747] Each of these examples can be examined in relation to the important roles of health professionals in protecting human rights and other lessons learned from the history of medicine in the Nazi era.

Enduring legacies of medicine in Nazi Germany

There are tangible and intangible legacies of medical collaboration in Nazi Germany, with continuities and consequences that reach far beyond the end of World War 2 to the present. Health-care professionals continued their careers after the war, usually after a brief hiatus during which they underwent the so-called denazification process. The same is true for academia—in education, research, and patient care. Most of these people never admitted to any wrongdoing during the Nazi period and continued their scientific work across all medical disciplines and scientific fields. Their wartime and post-war publications became part of the canon of medical knowledge[586]—a continuity that the medical profession needs to be aware of. All medical knowledge has a history, and health-care professionals need to reflect on the origins of what they know. Questions to ask include: how was this knowledge gained? Who was involved? Who suffered? Who profited? What are the conditions that allow for medical knowledge to be produced in ethically acceptable ways? What are the ethics of using unethically gained knowledge? The answers partly depend on the specific contexts in which the information was acquired and how the information is to be used.[748–751]

In addition to the circulation of unethically obtained information, physical remains of Nazi victims continue to be discovered, either inadvertently or during systematic investigations of scientific collections.[471,752] The 2017 recommendations on how to deal with Nazi era human remains—known as the Vienna Protocol[753]—are formulated in such a way as to be applicable beyond the setting of the Holocaust in the context of other human rights violations and crimes against humanity. The Vienna Protocol also provides recommendations for institutional collections, namely to pay attention to the wishes of communities of descent and their traditional customs in the handling of human remains, similar to recommendations released by museum associations—eg, in Germany.[754] There still are legacy anatomical and histological collections in Germany and the formerly occupied and annexed territories that need to be searched for human remains from Nazi victims. The history of these collections is, however, intricately interwoven with that of older collections from colonial contexts in Europe and worldwide, many of which are also finally coming under closer scrutiny, with essential input from descendant communities and an emphasis on ethical questions relating to dealing with human remains.[755] In future, the creation of ethically sound collections of human remains needs to be based as far as possible on informed consent obtained directly from the concerned individual or from legitimate proxies.

Another legacy is medical eponyms honouring Nazi perpetrators and those honouring victims of Nazi persecution (panel 14). Discussions have centred on whether the names of these conditions should be

changed, replaced, or abandoned.[545,546,756] Whereas there is agreement that eponyms referring to those who were persecuted by the Nazi regime "should be remembered and even strengthened",[546] many believe that use of terms named for perpetrators should be dropped. Others have argued that abandoning the eponymous use of the names of Nazi perpetrators would amount to an erasing or denial of Nazi medical crimes and could diminish remembrance of the origins of such knowledge.[757] Changing the names of these conditions could also result in the loss of an opportunity for teaching about the history of medicine.[266,286,757,758] All these arguments need to be considered in the broader context of calls for the decolonisation of the medical curriculum,[759,760] including the replacement of historical eponyms with names based in precise medical terminology.

This issue has engendered debate about whether it is "time to see the meaning of eponyms in a different light altogether".[286] Although eponyms have been described as "one of the finest ways to be recognised", this hagiographic approach no longer reflects "the ethical values of modern medicine and life in a society based on equality. Rather, eponyms should be recognised as simple historic markers, inherent to their time and intricately connected to their historical framework."[286] In this reframing, eponyms become teaching moments and opportunities for the grounding of modern medicine in its history, both positive and negative. One area of broad agreement is that any discussion of eponymous perpetrators of harm needs to be accompanied by full acknowledgment of their victims.[286,761]

Commemoration and memorialisation of victims and survivors of medical crimes serve the educational and formative purpose of embedding the memory of Nazi atrocities in each health professional's identity as a warning to uphold human rights. They are expressions of respect for the victims, their suffering and fate, and seek to anchor professional ethics in "a community of memory".[762] Medical communities worldwide have connections to tragic chapters in history, and the suffering and grief of many people paved the way for modern bioethical regulations. Each community of health professionals should research and recognise its past and acknowledge its responsibility. This work is ongoing.

The examples of contemporary implications of medicine's involvement in Nazism and the Holocaust discussed in this section provide a glimpse into the wealth of insights that can be gained for contemporary medicine from a thoughtful reflection on this complex and terrifying past. Two principles should guide the creation of historical awareness in this domain: close attention should be paid to the historical evidence (including an acknowledgment that new historical evidence could lead to new interpretations), and contemporary theories and practices in clinical medicine and medical science should be critically scrutinised to allow for the recognition of relevant recurring patterns. Clear recognition and discussion of differences between then and now are also important, and oversimplified Nazi analogies that might stifle further reflection should be avoided.[573,763,764] Based on these principles, teaching on medicine, Nazism, and the Holocaust needs to become a standard component of all health-care curriculums.

Part 5: Conceptual framework for teaching medicine, Nazism, and the Holocaust

The history of the medical crimes during Nazism and the Holocaust, despite its relevance to the emergence of medical ethical codes after World War 2, is rarely included in health sciences curriculums, and previous international appeals to integrate the topic into educational agendas[765,766] have so far failed to meet with a wider response. This Commission was tasked with the assessment of any existing curriculums and with proposing suitable educational approaches for learning about medicine, Nazism, and the Holocaust, to "promote ethical conduct, compassionate identity formation, and moral development".[3]

In this section, we explore the conceptual and practical challenges in incorporating this history into health sciences curriculums. We examine the continued relevance of this content for health care and present a new conceptual paradigm, history-informed professional identify formation. Then, in part 6, we provide a roadmap for health sciences education about medicine, Nazism, and the Holocaust that explores where to situate the topic within curriculums, as well as pedagogical approaches, modes of assessment, and faculty development. Importantly, by using the terms health science and health professionals, our intention is to address everyone involved in the provision of health care: physicians, nurses, midwives, physician assistants, health science researchers, health services social workers and psychologists, physiotherapists, occupational therapists, paramedics and other emergency medical personnel, and administration staff, among others. Because physicians' roles in Nazism and the Holocaust have been more extensively documented than those of any other health professions, they are used as an example from which broader implications can be drawn in the absence of specific evidence for other fields. We believe that our analysis and conclusions are relevant to the education of all health professionals.

Bioethics is informed by medical involvement in Nazism and the Holocaust and the various associated ethical, policy, and practice implications, any one of which alone would justify learning about this history. Health professionals and medical scientists, clinicians, historians, ethicists, and medical educators who work in this domain have personally experienced the transformative power of engaging with, and reflecting on, this history and the contemporary implications. On the basis of this experience and emerging research, we propose that learning about, and reflecting upon, this history supports the formation of morally courageous and resilient professionals[1,766–769] equipped to confront

current and future ethical challenges[1,3,570,767–770] and of a professional community with the capacity to shape and support collective moral courage and resilience.

In the context of medical education scholarship, moral courage is understood as a "willingness to stand up for and act on one's ethical beliefs".[770] Although not directly analogous to the moral courage required to confront Nazism, students today are still called on to display moral courage—from addressing instances of sexual harassment or discrimination based on gender, race, ethnicity, religious affiliation, or sexual orientation to confronting current or future pandemics, wars, increasing political authoritarianism, and many other crises with disruptive consequences for health and society. Courage is also needed when standing up within the medical hierarchy to ensure patient safety.[771–775] Trainee health professionals might experience moral distress or even moral injury if pressed to "commit or witness an act that violates their moral belief system",[773] which can occur in times of uncertainty, when conflicts in values emerge, or when demanded to solve problems and make decisions under pressure (eg, triage or resource allocation under conditions of scarcity).[771–773] Learning about the history of medicine, Nazism, and the Holocaust inevitably provokes reflection on contemporary challenges demanding moral courage from individuals and professional groups, and on how to support individual and group moral agency[772] as a way of mitigating moral distress and injury.[772,773]

Health care has been described as a moral enterprise[774] that has profound effects on all aspects of students' and practitioners' being, yet a decline in moral reasoning in medical school education has been reported.[776–778] In this context, learning about the history of medical involvement in Nazism and the Holocaust can initiate or support an educational focus on empathy, compassion, moral reasoning, and justice in caregiving—which includes taking a strong stance against antisemitism, racism, and other forms of discrimination.[779] The findings of a scoping review about physician resistance to injustice and harm emphasised the need for teaching in this domain, with the authors concluding that, "At a time when physicians are facing an ever-growing number of practical, ethical, and moral challenges, professional acts of resistance are of critical concern within the profession."[780]

Trainee medical professionals also need to navigate the so-called implicit or hidden curriculum.[781] Sometimes referred to as medical culture, this term describes the unwritten, unofficial lessons about expected and unexpected, acceptable and unacceptable values and behaviours, which students and practitioners learn by observation during their training and practice, even if these lessons are not intentionally taught.[771] Reflection on the history of medicine, Nazism, and the Holocaust will often lead to discussions about research into social conformity, debates about the extent to which individual behaviours are shaped by personality, character, or contextual circumstances,[685] and discussion about how to influence and support individual and group moral norms in stressful conditions.[682] This history provides unique opportunities to explore both the hidden power of culture on individuals and groups, and how changes in that culture can be effected.[1,3,78,770,782]

Finally, trainee medical professionals might experience difficulties in resisting or speaking up, for example in the face of an error they witness, when disagreeing with a superior's clinical decision or when faced with antisemitism or racism in health care.[783–788] Barriers to speaking up can be cultural, hierarchical, based in traditions of obedience and conformity, or caused by fear of retribution.[783,785–788] Pedagogies intended to overcome these barriers have been suggested, although their effectiveness remains unclear.[789,790] A strategy that has been suggested is the curricular inclusion of content on different types of resistance—such as truth-telling, whistleblowing, advocacy, activism,[710] civil disobedience,[708] and other forms of individual and community action.[710,791] Such curriculums are intended to shape health professionals who can become "agents of democracy".[792] Educational modules on methods of advocacy and resistance can be enriched with case studies from the history of medicine, Nazism, and the Holocaust.

History-informed professional identity formation

The notion that professional identity formation should be grounded in an understanding of the history of the health professions builds on scholarship in the domains of professionalism, professional identity formation, and "informative, formative, and transformative learning".[792] We call this concept history-informed professional identity formation. Although professional identity formation is relevant to all health professions,[769] we focus on medical education as an example.

The so-called professionalism movement in medicine,[792–795] which is now more than 30 years old, was a response to perceived threats to professional values and diminishing public trust.[3,570,769,794–796] The professionalism literature thus contains many references to shared core values and desired behaviours of health professionals with the explicit aim of fostering public trust—although these values and behaviours were not always clearly defined and were mutable within and between different disciplines and populations.[3,792–798] In this context, it became apparent that professionalism is not only about learning the values and behaviours expected of professionals but also, at a deeper level, about the formation of an identity as a health professional.[798–801]

In medicine, professional identity is defined as "a representation of self, achieved in stages over time during which the characteristics, values, and norms of the medical profession are internalized, resulting in an individual thinking, acting, and feeling like a physician",[798] and its formation is viewed as a lifelong process that integrates self-reflection with the profession's core values and beliefs and moral principles.[799] Understanding

professional identity formation as the process of becoming a health professional through learning and internalising professional value norms has become an overarching educational aim in many training programmes.[792,793,796,798–801] Educators in this space, however, have recognised that this process requires critical ethical vigilance about the need to both accept and adhere to professional norms, and to view professional identity formation as a dynamic "active, constructive, and transformative"[800] process that often requires grappling with an imperfect status quo.[801] For example, reflection on the "context and meaning" of professional work should support students' sense of agency and promote "re-examination of values and biases" to facilitate "finding meaning in one's work", and, crucially, such reflection should give rise to a robust professional identity.[801]

History-informed professional identity formation entails reflection on the history of the health professions as a means of building moral agency[802] among health professionals, thereby enhancing their capacity to serve as stewards of shared professional values. More specifically, by learning about and reflecting upon past ethical failures within one's profession, one can internalise professional norms as part of a process of critical reflection about what professional values and priorities should be. Attending to moral agency during professional identity formation challenges students to never unquestioningly accept professional structures and culture (or proposed changes to them), but rather to critically scrutinise them, explore their origins, assess the alignment between one's personal values and those of the profession, and examine both for areas of weakness.[802,803]

Although we recognise the limits of analogies, within the concept of history-informed professional identity, knowledge of history informs the modern culture and ethics of health care similarly to how knowledge of the basic sciences informs the modern practice of medicine.[804] One might be an acceptably good clinician without detailed knowledge of the underlying physiology and biochemistry of every condition, but to become an agent of change for the clinical approach to a specific condition—to improve on, rather than merely replicate, current practice—knowledge of the basic sciences is essential. Similarly, one can adopt and practise according to professional ethics without understanding how these ethics arose and how they have been altered in the past (eg, in Nazi Germany), but to serve as a change agent and an effective steward of professional ethics, defending ethics when necessary or challenging them when appropriate, historical knowledge is crucial. Furthermore, similar to how a detailed patient history is essential for clinical reasoning and care, knowledge of the history of the medical profession is essential for ethical practice, as medical historian David Jones and colleagues state: "History offers essential insights about the causes of disease…the nature of efficacy…and the contingency of medical knowledge and practice [including ethical dilemmas] amid the social, economic, and political contexts of medicine. These are all things that physicians must know in order to be effective diagnosticians and caregivers, just as they must learn anatomy."[804]

To complement a focus on professionalism and professional identity formation in the past two decades, medical educators have conceptualised different levels of learning. The 2010 *Lancet* Commission on medical education[792] had the goal of renewing medical education "to strengthen health systems in an interdependent world", and defined "transformative learning" as the "highest of three successive levels, moving from informative to formative to transformative".[792] Informative learning is the acquisition of knowledge and skills with the purpose of producing experts, formative learning is the socialisation of students around shared values with the purpose of producing professionals, and transformative learning is the development of professional leadership attributes with the purpose of producing "enlightened change agents".[792] Formative learning corresponds to the concept of professional identity formation. History-informed professional identify formation, however, can also support transformative learning in health care: learning about history can have a crucial role in helping students to understand the present and shape a better future for health care. In 2022, the authors of the *Lancet* Commission on medical education revisited their work and noted that the effects of the COVID-19 pandemic (ie, societal and personal challenges, as well as technological changes) helped to validate the initial framework of informative, formative, and transformative learning and showed the remarkable acceptance and implementation of this framework.[793]

A second possible analogy for history-informed professional identify formation comes from lessons from the patient safety movement. In the past 25 years, there has been increasing agreement that mistakes are unlikely to be remedied without explicit and open acknowledgment that errors occur and their causes need to be studied, including the underlying systemic factors.[725] Analogously, there are obvious risks associated with socialising individuals into a professional group without providing opportunities for careful examination of mechanisms that led to moral corruption in this profession and its members in the past, including open exploration of potentially persisting dynamics that previously health-care professionals to view egregious wrongdoing as professionally acceptable. Recognition that professional groups (most saliently, in Nazi Germany) have, in the past and under specific conditions, radically changed ethical norms and beliefs and become perpetrators of unprecedented medical crimes, and acknowledgment that something similar could happen again, are promising strategies for developing future generations of professionals trained to have a valuable combination of humility, moral agency, and assertiveness.

Where in the curriculum can this history be learned?

We call for the history of medicine, Nazism and the Holocaust to be a mandatory and specific domain of teaching in health sciences education, including opportunities for reflection on the contemporary implications of this history. We acknowledge that the curriculum is already crowded, but space should be made for this topic, and there are several options for when such content could be delivered. All courses on health-care history need to include sessions on medicine, Nazism, and the Holocaust. Other options are the inclusion of the domain within other fields, from specific medical disciplines to the medical humanities, bioethics, critical thinking, or professionalism curriculums. However, we advocate for a best practice option, with the history of medicine, Nazism, and the Holocaust as a stand-alone fully developed curricular subject. This history could help learners to contextualise the emphasis in contemporary bioethics on values such as privacy, confidentiality, autonomy, and justice, could prompt conversations about hierarchies in health care, and could be a springboard for discussions about the connections between health care and public-health ethics.[725] In a professionalism course, the history of medical involvement in Nazism and the Holocaust could be used to stimulate discussions about whether the ethics of health-care professionals are inherent to the work of caring for ill and vulnerable patients, or whether the ethics of health professionals in Nazi Germany—which rejected values such as inclusive, altruistic devotion to advocacy for all ill, vulnerable people and explicitly excluded specific groups from health care—can still be called health-care ethics.[78,481,725,782]

In addition to specific curricular elements in bioethics, the history of medicine, and the medical humanities, references to the history of medicine, Nazism, and the Holocaust can also be included in various other medical disciplines and subjects. Other fields that can provide insights into, and also be informed by, this history include psychology, anthropology, sociology, literature, cultural studies, and political science. The study of medicine, Nazism, and the Holocaust can prompt reflection on many contemporary policy issues in health care, including resource allocation dilemmas, appropriate regulation and use of genetics, social roles of health professionals at the beginning and end of life, the challenges of professional self-regulation, the influence of politics on health care, and the relationship between the government and the medical profession.[3,765,791,805–807] In particular, learning about this history reliably provokes critical reflection on the roles of science, medicine, and medical education in countering antisemitism and racism, including systemic racism.[3,765,773,808,809] Teaching and fostering reflection on this history should therefore also be integrated into diversity, equity, and inclusion initiatives in health sciences education and practice.[810,811] For training programmes that draw explicit attention to the hidden curriculum,[781] the history of medical involvement in the Nazi era can facilitate discussions about underlying dynamics in health care that might increase health professionals' susceptibility to becoming hardened to patient suffering, to abusing professional power, to turning a blind eye to antisemitism and racism, or to becoming bystanders, supporters, or perpetrators of ethical transgressions.[481,805]

The history of medicine, Nazism, and the Holocaust can also be addressed through dedicated courses in history, philosophy, arts, critical thinking, and health humanities.[805,806] Arts and the humanities can have special roles in education about this painful history, involving the use of original archival material, historical media and narratives, music, and visual and other arts. The health humanities can convey the implications, nuance, and emotional effects of this history in a way that goes beyond the summarising of information in a chart or graph. Furthermore, the study of medicine, Nazism, and the Holocaust could help students to achieve several common learning outcomes in health humanities education, including perspective-taking, personal insight, critical reflection, hermeneutics, and social accountability. The subject promotes critical reflection on inequities, civic mindedness, and advocacy for transformational change in medicine and society.[807]

In summary, although a course dedicated to learning about and reflecting upon the history of medicine, Nazism, and the Holocaust would be ideal, integration into bioethics, professionalism, or other courses is also appropriate, and there are various other opportunities throughout health science curriculums for this history to stimulate transformative learning by raising moral awareness, sensitivity to nuance and context, and professional humility.[3,481,770,805–811]

Part 6: A roadmap for teaching the history of medicine, Nazism, and the Holocaust

In our experience, sharing the history of medicine, Nazism, and the Holocaust usually commands rapt attention among learners and has a profound effect that is often formative and even transformative. The basic requirements for teaching in this domain are met when a teacher is willing to familiarise themselves this history and employs an authentic teaching approach with dedication and commitment. To help educators in this task, this Commission has rigorously examined and operationalised state-of-the-art medical education concepts for the effective teaching of the history of medical involvement in Nazism and the Holocaust.

Steps to integrate this history into the education of health professionals include choices of content, pedagogies, and modes of assessment. To facilitate these steps, in this Commission we offer a method for designing curriculums, supported by a primer on medical education (appendix pp 4–12), case histories embedded in a narrative of the historical background

(appendix pp 13–21), a roster of syllabuses (appendix pp 22–32), and a glossary and translation of German terms and abbreviations (appendix p 33). Notably, the number, quality, and variety of internet-based educational resources about the history of medicine, Nazism, and the Holocaust have increased considerably since the first conceptualisation of this Commission in late 2020,[812–818] partly due to the huge increase in web-based learning platforms prompted by the COVID-19 pandemic.[819,820]

Building educational modules

Educators are encouraged to embark on instruction in this domain equipped with the core historical knowledge outlined by this Commission, supplemented by additional materials depending on the scope of teaching, as well as the time and resources to be allocated to the new curricular content. A pedagogical approach that has proven particularly effective is the centring of various methods of reflection.[821–823] Positive outcomes have been reported especially for the use of reflective writing exercises to support professional identity formation and ethical conduct.[800,801,814,821–824]

A process for building a new educational module on medicine, Nazism, and the Holocaust is outlined in figure 13. Depending on the instructor's field of expertise or interest, the relevant historical evidence should be presented together with potential implications for present-day medicine, within a module adapted for the level of the learners (from basic to intermediate to advanced), curricular time available, and the intended effect (from informative to formative to transformative).

Examples of core learning outcomes, stratified by content depth (from beginner to advanced) and learning levels (from informative to transformative) are outlined in panel 24, and a more detailed listing of learning outcomes is in the appendix (p 6).

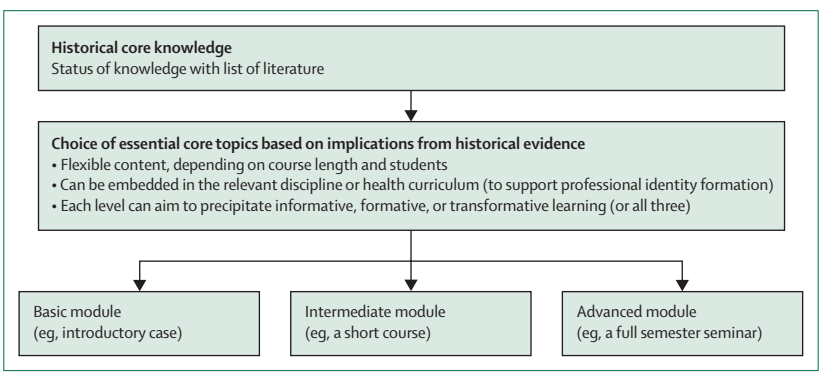

Figure 13: **Roadmap for teaching about the history of medicine, Nazism, and the Holocaust**

***Panel 24:* Core learning outcomes for a curriculum on medicine, Nazism, and the Holocaust**

Basic or informative learning outcomes

After taking this course, learners should be able to:

- Briefly explain what the Holocaust was, including who the perpetrators and victims were, and what Nazism, genocide, racism, and antisemitism are
- List the core facts about the involvement of health professionals in the Nazi regime, including in eugenic sterilisation and patient murder programmes, the antisemitic exclusion and persecution of Jewish health professionals, coercive, non-consensual human research, and the connections between these programmes and the Nazi genocide of European Jewry and mass murder of Sinti and Roma and other persecuted groups
- Describe and reflect on actions and experiences of Jewish and non-Jewish health professionals who resisted during this period, especially in ghettos and camps
- Describe, explain, and reflect on the ethical failures and transgressions of health professionals and the medical-scientific establishment during Nazism and the Holocaust and how these failures could have influenced bioethics after World War 2
- Apply insights from the history of medicine during Nazism and the Holocaust to contemporary issues in health care

Intermediate or formative learning outcomes

After taking this course, learners should be able to:

- Recognise and describe features of this history that are complex and nuanced, such as the coercion–resistance spectrum of prisoner–physicians[307] and underlying dynamics for health professionals (eg, the potential for abuse of power, the need to navigate conflicts of interest, and the threat of dehumanisation of patients)
- Integrate knowledge of this history to describe what it means to become a health professional today, including explaining the privileges and obligations of health professionals in contemporary society
- Describe how professional ethical standards can arise from, or be affected by, changing social norms, using examples from the history of medicine, Nazism, and the Holocaust
- Apply the history of medicine, Nazism, and the Holocaust to describe, reflect upon, and challenge the inherent potential for abuse of power in health care

Advanced or transformative learning outcomes

After taking this course, learners should be able to:

- Integrate the history of medicine, Nazism, and the Holocaust to describe, reflect upon, and manage conflicting obligations as a health professional
- Apply the history of medicine, Nazism, and the Holocaust to describe, reflect upon, and sustain appropriate levels of humility as a health professional, including in regard to scientific theories and their application for patients and communities
- Analyse the history of medicine, Nazism, and the Holocaust to describe, reflect upon, and uphold human rights[601,744] and the dignity of patients and groups that the profession serves

Curriculum development

Standard resources are available to guide general curriculum development, so here we highlight some practical and strategic suggestions for curriculum development with specific relevance to the history of medical involvement in Nazism and the Holocaust.[825,826] Kern's widely accepted framework for the development of medical education curriculums comprises a six-step sequence: problem identification and assessment of general needs, assessment of targeted needs, setting of goals and objectives, devising of educational strategies, implementation of the curriculum, and assessment and feedback.[827–829] It is applied in panels 25 and 26 with two examples from this domain,[766,798,828,831] and presented in more detail in the appendix (p 8). The examples represent a semester-long course—a recommended time

***Panel 25*: Example of a full semester course on the history of medicine, Nazism, and the Holocaust**

Background

- In 2011, the Autonomous University of Madrid (Madrid, Spain) announced a call to faculty members for the design of new elective subjects related to human rights and combating all forms of discrimination. These elective courses were designated as complementary curriculums to be included in the European Higher Education Area. The following syllabus, titled "The Holocaust: a reflection from medicine", was designed by Esteban Gonzalez-López and Rosa Rios-Cortés to fulfil these requirements.[768,830] The course can be taken by any student in any year of their studies (there are 40 slots per academic year).

Goals

- To compare the characteristics of the contemporary medical profession (skill sets, attitudes, and values that enable health-care professionals to earn the trust of their patients and society) with health professionals' attitudes and actions during the National Socialist period.
- To analyse the significance of medicine, Nazism, and the Holocaust in the creation and development of regulations pertaining to human research.
- To develop respectful attitudes towards gender, cultural, health, and other differences.
- To contribute to upholding and cultivating professional identity formation.

Learning outcomes

- To promote critical and self-critical reasoning.
- To maintain ethical integrity and concern for professional ethics.
- To recognise the essential elements of the medical profession, including ethical principles, legal responsibilities, and professional activity regarding patients.
- To understand the importance of such principles (especially regarding patient confidentiality) for the benefit of patients, society, and the medical profession.
- To promote social justice during professional practice and understand the ethical implications of doing so in a constantly changing world.
- To respect patients' autonomy, beliefs, and culture.
- To know the fundamentals of medical ethics and about making decisions on moral dilemmas.
- To practise medicine with excellence, altruism, responsibility, integrity, honesty, and a sense of duty.
- To acknowledge the economic and social implications of efficiency within medicine.

Content

- Historical frameworks (1918–45).
- Workshop on how to analyse written and audiovisual documents.
- The role of Nazi doctors and nurses in eugenics and the so-called euthanasia programmes.
- Jewish doctors in ghettos and camps.
- Nazi doctors in concentration and extermination camps.
- Medical experiments.
- Medical and psychological consequences for Holocaust survivors.
- Traces of the Nazi period in medicine today.
- Lessons from the Holocaust for contemporary medicine.

Pedagogy

- Each session lasts 2 hours. Within every session, 20 min should be devoted to facilitator briefing and comments on the previous lesson and assignments completed by the students, an hour should be spent on the lecture and viewing of any recorded materials, and 15 min should be devoted to discussing the lecture, answering questions, and reviewing the next task. Participation and debate should be encouraged, and discussion in small groups and meeting a Holocaust survivor should be pursued whenever possible.

Assessment

- Students are required to present a weekly reflective assignment on one of the case studies presented in the previous lesson. In the last session, students are encouraged to search the media for any examples that show a breakdown in ethical values (degradation of professionalism, misuse of physicians' power, research limits, or physician-government collaboration) in recent times.
- Completed exercises are uploaded onto the online learning platform, Moodle. There is no examination. The final grade is an average of students' scores on all the individual assignments submitted. Questionnaires on some bioethical issues are handed out at the beginning and again at the end of the course as a compulsory assignment. The students are also asked to express their opinions on the subject and about how to use what they have learnt in their future career.

allocation—and a basic introductory session that can serve as an intervention to sensitise participants to the implications of the topic.

With the rising number of antisemitic and racist attacks in health care and medical education during the COVID-19 pandemic, as outlined above, attention to the ubiquity of these prejudices has been growing, prompting calls to promote awareness-building and introduce change interventions. Examples of such changes include the creation of offices for diversity, equity, and inclusion in many medical schools and the integration of diversity, equity, and inclusion competencies in medical education,[832] including via new educational efforts such as seminars on religious discrimination in health care (Lefkowitz A, Kuper A, Najeeb U, University of Toronto, personal communication).

Pedagogies

Broadly speaking, lectures are the most common pedagogical approach used in teaching the history of medicine, Nazism, and the Holocaust. Films, readings, podcasts, and videos can also effectively convey the historical facts and present opportunities for reflective learning. Most of the extant curriculums for teaching medicine, Nazism, and the Holocaust do not explicitly assess formative and transformative learning, but pedagogical insights can be derived from relevant proxies, especially from professional ethics and health humanities teaching. In this regard, experiential and interactive teaching and learning,[833–835] as well as the inclusion of opportunities for reflection,[769,800,801,821–823] are pedagogies that can improve lectures and are supported by the literature and our personal experiences.

Pedagogical approaches depend on the intended learning level. At the informative level, the instructional goal is to engage learners and ensure retention of information. Some promising effective pedagogical approaches[793,836] include interactivity,[833] case-based and team-based learning,[834] and the so-called flipped classroom,[835] as well as technology-supported and online instruction (appendix p 6).[793,816,818,837] For formative and transformative learning, several pedagogies are suitable

Panel 26: A sample presentation about the legacy of medicine during the Holocaust and its contemporary relevance

Background

Recognising the importance of history for understanding contemporary circumstances and confronting future challenges, leaders of the American Association of Medical Colleges sought a medical education webinar about the history of medicine, Nazism, and the Holocaust[814] to be held on International Holocaust Remembrance Day for an international audience of students and health-care practitioners. The first iteration of this 75-min webinar, which was written and delivered by Commission authors HSW and SH, was delivered on Jan 27, 2022. Materials for optional post-webinar critical reflection sessions, including writing prompts from art or case studies, were also provided to facilitate reflective learning. The goal of the session was to provide core information about the history of medicine, Nazism, and the Holocaust and contemporary implications for health-care professionals worldwide.

Learning objectives

After the session, participants should be able to:

- Discuss why learning about and reflecting upon egregious ethical transgressions by physicians and the medical establishment during Nazism and the Holocaust is necessary within medical education for the cultivation of morally resilient lifelong professional identity formation and the promotion and preservation of humanistic health care.
- Describe examples of the history of healers becoming killers, as well as examples of health professionals who showed moral courage and resistance and the implications for oneself as a health professional.
- Recognise the contemporary relevance of the legacy of health professionals' involvement in Nazism and the Holocaust when facing ethical dilemmas, potential abuses of power, competing loyalties, need for moral courage, and diversity, equity, and inclusion issues in clinical practice and research, as well as public policy and contemporary societal issues of preserving human dignity.

Content

- Introduction: relevance of this history for fostering professional (moral) identity formation
- Key points of the history of medicine, Nazism, and the Holocaust from the beginnings to the Nuremberg Doctors' Trial
- Examples of moral courage of Jewish ghetto physicians and the Righteous among the Nations under oppression
- Personal story of Holocaust suffering and survival
- Implications: echoes and patterns of the past in the present
- After the webinar, participants were asked to complete a survey—a self-assessment of the effect of the webinar on personal learning and actions, with opportunity for comments

Conclusions

- The webinar presented opportunities for informative and formative learning, as well as content for reflection to achieve transformative learning
- Evaluation results show that the webinar achieved formative learning for some attendees
- Transformative learning cannot be assessed with a survey immediately after an intervention; longitudinal assessment might be helpful for assessment

to support history-informed professional identity formation,[838–840] including reflection,[821–823] mentoring,[841] small-group case-based discussion,[842] emotion-processing modalities (eg, Balint groups),[841–843] creating portfolios for learning experiences and reflections,[844] critical incident analysis with debriefing of actual clinical events that summon ethical dilemmas and moral distress,[845] studying survivors' interviews and testimonies,[846,847] use of topical films and shared processing,[848] and dedicated visits to Holocaust sites such as concentration camps,[849,850] museums, and exhibitions.[851–854] Visits to museums can be a valuable addition to other forms of learning, and visits to historical sites such as concentration camps can substantially facilitate transformative learning, as assessed by reflective writing.[570,824] In addition to serving as an assessment tool, reflective writing after an educational session can serve to consolidate learning, and the process of reflection itself can become a transformative learning experience.[809,823,824]

Assessment

Many domains of health sciences learning that are considered indispensable for the health-care professions —including anatomy, physiology, and pathology—are defined on the informative level of content and learning, and have not yet been solidly connected to documented gains in formative or transformative learning, even if their implicit curriculums would allow for such connection. Furthermore, many curriculums that specifically aspire to professional identity formation and transformational learning have not yet documented their outcomes on the levels of formation and transformation. Although people who teach the history of medicine, Nazism, and the Holocaust are convinced of the transformational effects for many learners, objective measurement of these effects similarly remains elusive.[855] An ideal assessment strategy in this field should include assessments of knowledge before and after the curriculum has been delivered, assessment of learner satisfaction, and self-assessment of informative learning objectives, which can also be administered before and after the course for comparison.[570,767,768,855,856] Assessment of informative learning is straightforward, but assessment of formative and transformative learning is more challenging.[824,855–857] Some instruments for assessment of ethics learning or professional identity formation (appendix p 10) are not well suited to instruction in the history of medical involvement in Nazism and the Holocaust, because they have poor psychometric properties or are not sufficiently specific to the education of health professionals.[855,858,859] However, several instruments could be worth adapting to enable measurement of formative and transformative learning in this domain, including the Defining Issues Test 2,[860] the Professional Identity Essay tool,[861] and the Reflection Evaluation for Learners' Enhanced Competencies Tool (appendix p 10).[862]

Intended audience

An important consideration for each educational intervention is the intended audience, which could be a mixed general audience, a specific health professional group (eg, doctors, nurses,[863] psychologists,[864] dentists[865,866]), a specialty group (eg, psychiatrists,[867] urologists,[868] radiologists,[852] anatomists[869]), or a group of learners from a specific country or region.[870] To increase relevance and audience engagement, content should be tailored, with a focus on the characteristics of the learning group. For example, it would be useful to draw attention to the history of the relevant professional group or specialty within the general history of medicine, Nazism, and the Holocaust. In certain countries, however, local historical references that echo components from the history of medicine, Nazism, and the Holocaust should be incorporated. Such echoes might be found in national or regional instances of, for example, forced sterilisation, unethical human experimentation, or medical maltreatment of minorities. Examples of tailored programmes include a medical school seminar with post-seminar reflections focused on issues of equity and inclusion,[814] a hybrid course for a nursing school focused on nursing in Nazi Germany,[871] a dental curriculum that included the theft of dental gold in Nazi concentration camps,[866] and a study trip to Holocaust-related sites in Poland for medical personnel in the Israeli Army that aimed to explore the issue of competing loyalties in military medicine.[850]

Special attention might be required when the expected audience has little previous exposure to the history of Nazism and the Holocaust. Educators in such contexts might seek out connections between this history and their audiences' experiences, on a personal, collective, or national level.

Faculty development

Faculty development refers "to all activities health professionals pursue to improve their knowledge, skills, and behaviours as teachers and educators, leaders and managers, and researchers and scholars, in both individual and group settings".[872] Although there are many programmes for teaching about the Holocaust, there are very few regularly available courses about medical involvement in Nazism and the Holocaust. However, the large-scale implementation of education in this domain will depend on enhancing the skills of current teachers and inviting those interested to become future educators in this domain. Faculty development is therefore especially important to the goals of this Commission.[873–875]

Traditional approaches to faculty development in medical education consist of learning from experience, peer coaching and mentorship, and workshops or seminars. Individual learning from experience is often associated with learning with and from peers and enhanced through integration in a learning community of shared interests and concerns.[872] Potential faculty development pedagogies and formats include intensive longitudinal programmes,

online learning, narrative medicine or reflective writing approaches, and an emphasis on transformative faculty learning that could translate into faculty fostering students' transformative learning.[874,875] In line with the Commission's recommendation to apply best practices in medical education to instruction in the history of medicine, Nazism, and the Holocaust, best practices for faculty development include the use of a competency framework, incorporation of role modelling, mentoring, and reflective practice,[872] the adoption of interprofessional education strategies,[872] and use of formative and summative assessments.

The future of teaching about medical involvement in Nazism and the Holocaust

To conclude this exploration of evidence-based best practices in health professions education and their application in teaching the history of medicine, Nazism, and the Holocaust, we propose a set of recommendations to guide future work on education (panel 27). Within our endeavours in health professions education, we have a moral responsibility to the public to promote and cultivate the development of reflective and morally resilient health professionals. The Commission considers history-informed professional identity formation an integral component of fulfilling this responsibility.

Conclusion

The Nazis' reign of terror, which culminated in the Holocaust, profoundly affected the history of Europe and the world. Among the most disconcerting aspects of National Socialism and the Holocaust are the many elements in this history that resonate with other times and places, including medicine's essential role in some of the regime's most inhumane policies. As a result, contemporary bioethics developed to a large degree in response to, and in the shadow of, the revelation of the medical crimes committed under the Nazi regime.

As we argue in this Commission, there are many good reasons why health-care professionals should know about this history. For one, medicine still has to contend with some of the direct legacies of the Nazi regime, such as scientific findings based on inhumane experiments or studies of the human remains of Nazi victims, and eponyms honouring scientists with Nazi connections. Beyond that, studying the history of medicine, Nazism, and the Holocaust can help people to understand complex issues in modern biomedical ethics—including contemporary interactions between health professionals and the state; the importance of education in professional ethics; health equity and care for vulnerable individuals and populations; health professionals' responsibility to uphold patient rights, fight antisemitism, racism, and other forms of discrimination, and promote public health and safety; and the political, social, and moral determinants of health, health care, and the medical sciences. History-informed bioethical reasoning will continue to be needed in health-care education in the context of rapid technological advances, including generative artificial intelligence.[876]

***Panel 27*: Recommendations for education about the history of medicine, Nazism, and the Holocaust**

- Adopt the paradigm of history-informed professional identity formation as an educational framework for health professionals, in which history is recognised as essential knowledge for understanding contemporary health professional ethics.
- Use the history of medicine, Nazism, and the Holocaust to emphasise the unique opportunities and responsibilities of health professionals in the elimination of antisemitism and racism and the protection of vulnerable populations against stigmatisation and discrimination.
- Initiate and sustain reflection on medicine's core values with reference to historical choices made by individual health professionals, groups of health professionals, and medical scientific institutions during Nazism and the Holocaust.
- Identify potentially similar patterns of behaviour in, for example, the hierarchical systems of medical practice and institutions, or, in the wider sense, in other past and present authoritarian systems around the world.
- Prioritise stand-alone, fully developed courses for learning about this history, and aim to integrate them, when appropriate, into existing curriculums—not just as an add-on, but as an essential catalyst for formative and transformative learning.
- Use knowledge of this history to support people experiencing situations that can generate moral distress, and people seeking examples and sources of moral courage and resilience.
- Use recommended effective pedagogies for curricular design and teaching methods, including hybrid remote education, when seeking to initiate and enhance teaching on the history of medicine, Nazism, and the Holocaust.
- Create experiential learning opportunities, including visits to historical sites or museums when possible, and historical case studies that represent so-called real-life approaches to learning about and exploring professional ethics.
- Use reflective exercises to consolidate informative and formative learning and to create opportunities for transformative learning.
- Promote enhanced collaborations between historians, bioethicists, health sciences educators, and other relevant scholars to develop, implement, and assess innovative educational programmes about the history of medical involvement in Nazism and the Holocaust.
- Support holding both individual health professionals and professional organisations accountable for critical reflection on the core values of the profession.

The study of this history can also increase awareness of the substantial power of medical professionals in society and the inherent potential for abuse of this power, with lessons that are also applicable in much less extreme circumstances. The medical professions were central, active actors in Nazi Germany, whose collaboration and complicity cannot be explained by coercion or conformity alone. Their professional attitudes, political and ideological orientations, and scientific agendas and methods, as well as the widespread antisemitism and racism common throughout their ranks, were crucial preconditions to the medical crimes committed during Nazism. At the same time, the history of medicine, Nazism, and the Holocaust also includes examples of resilience and resistance, foremost in the Jewish medical resistance in ghettos and concentration camps, and in the actions of health professionals who helped Jews and other populations targeted by Nazi policies, often at grave risk to themselves and their families. Accounts of these individuals can inspire and guide learners when they confront ethical challenges in practice and policy—especially during times of crisis, such as wars or epidemics.[1]

Thus, we call for the introduction of teaching about the history of medicine, Nazism, and the Holocaust in all health-care education settings. This Commission can serve as an initial resource: it gathers key facts that we believe should be known to all, together with our thoughts on implications for health-care practitioners, educators, and researchers. Indeed, we believe that learning about this history and its contemporary echoes will enable and encourage learners to explore and analyse other histories of medical abuse and crimes and to engage with these legacies. Our work could serve as a model for future research, documentation, and education about other histories of medical collusion in inhumane systemic discrimination and violence. Likewise, this Commission sets a precedent for documenting, understanding, and learning from historical cases of medical resistance and resilience. We firmly believe that medical education is enriched by working with the proposed concept of history-informed professional identity formation.

In medicine, much depends on health professionals' ability to recognise patterns. Indeed, one of the main goals in health sciences education is to teach students to notice such patterns. We see this as an apt metaphor for what this Commission aims to accomplish, because "history allows us to see patterns and make judgements".[877]

This report is aimed at a wide range of disciplines. The primary readership addressed includes actors within health sciences training: educators, clinicians, scientists, researchers, administrators, and students. We also provide contextual information that we hope will be useful for historians, psychologists, and others. We hope that this Commission will find many readers around the world, specialists and non-specialists alike. Of particular importance, we hope that our work will be of interest to policy makers and leaders in positions to shape health-care education and health-care delivery. Crucially, history-informed professional identity formation is relevant both at the level of individual practitioners, educators, and researchers and to how current and future generations of leaders and policy makers conceive of—and construct—the social roles and responsibilities of the medical profession as a whole.

After all, the history of medicine, Nazism, and the Holocaust represents not only an example of individual medical professionals gone astray, but also a terrifying—yet instructive—example of the descent of world-leading professional institutions and organisations into the worst depths of medical atrocity. These institutional aspects make this educational endeavour extremely timely and relevant in addressing the "civilisational crisis" of today.[878]

Contributors

All members of the Commission contributed to the conceptualisation, investigations, methods, and writing of the report. The Co-Chairs (initially SPR, SH, and VR, with VR being succeeded by HC in September, 2021) invited members to join the Commission, raised funds, convened meetings, provided direction, and coordinated all communications and the processes of writing and editing. Most of the editing of the report was done by the Co-Chairs, and by TC, SJS, KU, HSW, and MKW. All members read and approved the final version.

Declaration of interests

TC has received honoraria and travel support for lectures, presentations, and educational events about medicine, Nazism, and the Holocaust from academic institutions only. HC has received travel funding for a *Lancet* Commission meeting in Jerusalem (2022), and a grant from the Max Planck Society for a project on the history of brain research using Nazi victims' brains. MF has received funding from the Israel Medical Association for leading seminar tours on medicine and the Holocaust. SH has received royalties from Berghahn Books for *The Anatomy of Murder*, honoraria from educational institutions for lectures about medicine and anatomy in Nazi Germany, and is an unpaid member of the Harvard Human Remains Research Review Committee and the American Association for Anatomy Task Force on Legacy Collections. EL has received royalties from Classiques Garnier for his book *L'Homme, cet inconnu d'Alexis Carrel, 1935*, serves as an unpaid member of the Israel National Commission according to the Patient at end-of-life Law (2005), and received travel reimbursement for attending a symposium at Cedars Sinai Center for Medicine, Holocaust and Genocide Studies (Los Angeles, CA, USA) and the *Lancet* Commission meeting in Vienna (2023). MO has received occasional honoraria from educational institutions for lectures on medicine, Nazism, and the Holocaust at educational institutions, as well as travel reimbursement for the *Lancet* Commission meetings in Jerusalem (2022) and Vienna (2023). AO declares travel reimbursement for attending the *Lancet* Commission meeting in Vienna (2023). VR received a grant for a project financed by the Max Planck Society on the use of body parts of Nazi victims in brain research. MR received a contract from the district of Upper Bavaria for research and a book project on victims of National Socialist euthanasia starting in October, 2023; received travel reimbursement for presentations on psychiatry in Nazi Germany at educational institutions; and serves as an unpaid member on the advisory boards for Brandenburg memorial sites, Hadamar memorial site, Irsee memorial site, Klingenmünster Psychiatric hospital, the Bernhard Nocht Institute, the German Society of Pediatrics and Adolescent Medicine, the German Association for Psychiatry, Psychotherapy and Psychosomatics, and the Hessian Ministry of Science. CS received an honorarium from the Max Planck Society (work contract) for participation at the *Lancet* Commission meeting in Vienna (2023). SJS received travel reimbursement from the Cedars-Sinai Center for Medicine, Holocaust and Genocide Studies for attending the *Lancet* Commission meeting in

Vienna (2023) and has received honoraria from educational institutions for presentations on medicine, Nazism, and the Holocaust. AT has received royalties from Cambridge University Press for the book *Social Mendelism: Genetics and the Politics of Race in Germany, 1900–1948*, and an honorarium from the University of Leeds (Leeds, UK) for a lecture titled "Mendeling Jews: a history of racial genetics". HSW has received honoraria from educational institutions for presentations on the legacy of medicine during the Holocaust and professional identity formation. MKW has received a grant from the Macy Foundation for the implementation of this Commission's first teacher training fellowship; has received honoraria from educational institutions for lectures on medicine and the Holocaust, which he donates to his institution's fund to support programmes related to this history; serves as Co-Chair of the American Medical Association's Truth, Reconciliation, Health and Transformation Task Force (for which he receives an annual honorarium that he donates to his university); and is an unpaid member of the Fellows Council for the Hastings Center and the Advisory Council for Physicians for Human Rights. All other authors declare no competing interests.

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