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If fetuses are persons, abortion is a public health crisis**

Pro-life advocates commonly argue that fetuses have the moral status of persons, and an accompanying right to life, a view most pro-choice advocates deny. A difficulty for this pro-life position has been Judith Jarvis Thomson’s violinist analogy, in which she argues that even if the fetus is a person, abortion is often permissible because a pregnant woman is not obliged to continue to offer her body as life support. Here, we outline the moral theories underlying public health ethics, and examine the COVID-19 pandemic as an example of public health considerations overriding individual rights. We argue that if fetuses are regarded as persons, then abortion is of such prevalence in society that it also constitutes a significant public health crisis. We show that on public health considerations, we are justified in overriding individual rights to bodily autonomy by prohibiting abortion. We conclude that in a society that values public health, abortion can only be tolerated if fetuses are not regarded as persons.

**Introduction**

At the time of writing, the world is still in the grip of the COVID-19 pandemic. Amidst fears of an exponential spread of the virus, hundreds of millions of individuals have been required to endure periods of strict lockdowns restricting their free movement. People in non-essential jobs could only leave their house for very limited reasons such as food, medical care, and exercise, and compliance has often been enforced by law. Schools have been temporarily closed, and millions of people have lost their jobs. Many businesses have been forced to permanently close.

It is widely believed that governments are obliged to protect public health, and control of infectious diseases is clearly part of this remit. This is at times in tension with individual rights, exemplified by lockdown restrictions intended to protect vulnerable populations such as the elderly and immunocompromised, and to slow or halt the spread of the virus. It may be that when a vaccine is available, its use is made compulsory in certain contexts to prevent resurgences of the virus, again overriding individual autonomy[[1]](#footnote-1).

This raises the question of what other public health crises might require the abrogation of certain individual rights. With regard to the abortion debate, pro-life advocates commonly argue for the immorality of abortion based on the fetus[[2]](#footnote-2) possessing the same moral status as children and adults—they are persons. However, Judith Jarvis Thomson’s violinist analogy[[3]](#footnote-3) purports to show that even if fetuses are persons, abortion is nonetheless permissible in many instances. She also implies that women should not be legally required to continue with pregnancy in these cases. This severely undermines the pro-life argument predicated on the personhood of the fetus. While there are cogent replies to Thomson[[4]](#footnote-4), we do not take a position on her argument here. Instead, we argue that irrespective of her argument’s success, if fetuses are persons and a society values public health, then the vast scale of abortion entails fetuses must be protected from its harm. This implies implementation of an abortion prohibition. It follows that abortion can only be tolerated in a society that considers fetuses to be of lesser moral value than children and adults, or that does not value public health.

**Public Health Ethics**

According to Ronald Bayer and Amy L. Fairchild, modern bioethics developed with a strong commitment to individual autonomy and rights[[5]](#footnote-5). Both they and Nancy Kass attribute this emphasis to the context in which bioethics emerged—medical care and human research[[6]](#footnote-6). This is in contrast to public health ethics, which Stephen Holland explains is concerned with ‘protecting and promoting population health’[[7]](#footnote-7), not individuals. Therefore, it cannot be assumed that bioethical principles are applicable to public health problems[[8]](#footnote-8). In fact, Bayer, Fairchild, and Holland suggest that achieving the goals of public health ethics may sometimes come at a cost to individual rights.

This raises the question of what moral theory underlies public health ethics. Given its emphasis on populations rather than individuals, it is unsurprising that many ethicists argue it should be based on some form of utilitarianism. For example, Holland states that utilitarianism is ‘the moral theory at the heart of public health’[[9]](#footnote-9). Julian Savulescu, Ingmar Persson, and Dominic Wilkinson argue that utilitarianism’s emphasis on our well-being makes it well suited to setting public health priorities[[10]](#footnote-10). Bayer and Fairchild claim that utilitarian considerations are central to public health policy makers[[11]](#footnote-11). Broadly speaking, utility in the public health context equates to population health, which Kass translates as reducing target population morbidity and mortality[[12]](#footnote-12). There is, of course, room for individual rights within utilitarianism[[13]](#footnote-13), but a sufficiently large increase in population health will justify overriding individual rights, although it is not clear what this threshold should be.

Fortunately, public health ethics can draw on another important moral principle from the liberal tradition regarding the health of target populations—John Stuart Mill’s harm principle. This states that ‘the only purpose for which power can be rightfully exercised over any member of a civilized community, against his will, is to prevent harm to others’[[14]](#footnote-14). In the context of public health, harm equates to a decrease in population health, equating to an increase in morbidity or mortality[[15]](#footnote-15). Avoiding a significant *decrease* in population health inflicted by others is therefore the primary justification for overriding individual rights in public health ethics.

Morbidity and mortality can be further broken down to calculate public health utility. The literature on healthcare priorities is relevant here, as it is concerned with allocating limited resources to increase public health utility. As Carl Tollef Solberg and Espen Gamlund explain, the primary goal of healthcare is to save lives—reducing mortality—and this assumes ‘longevity is valuable and that an early death is generally worse than a late death’[[16]](#footnote-16). Similarly, Kamm argues that when saving lives in a health care context, we should consider both the years of life saved and how good those years are expected to be[[17]](#footnote-17). Ceteris paribus, public health ethics implies that we should prioritise saving the lives of the young over those of the elderly if we cannot save both, as this maximises utility. This can be used to calculate trade-offs between target populations—preventing harm to one target population may cause harm to another.

**Public Health and COVID-19**

The current COVID-19 pandemic is a striking example of public health considerations being used as justification for abrogating certain individual rights. It recalls the case of Mary Mallon, also known as ‘Typhoid Mary’, an asymptomatic spreader of typhoid fever whose autonomy had to be curtailed in order to protect public health. Mary was forcibly quarantined on two separate occasions totalling 26 years[[18]](#footnote-18). In the case of COVID-19, governments were prompted into action by Imperial College’s epidemiological modelling that predicted if left unchecked, the virus would result in 40 million deaths worldwide[[19]](#footnote-19). Even moderate interventions such as isolation of cases and quarantine of those considered high-risk would still result in 250,000 deaths in the United Kingdom and over 1 million in the United States; lockdowns, however, were predicted to prevent most of these deaths[[20]](#footnote-20). Many countries chose to implement stringent lockdowns for several months, and at the time of writing, some lockdowns have been reinstated because of resurgences. These lockdowns entailed significant incursions on individual liberty rights—people could not freely leave their homes and could not associate. As a result, millions have lost their jobs, businesses, and many are likely to suffer mental health issues[[21]](#footnote-21). These considerable sacrifices of individual rights have been justified by the prevention of significant harm to others, primarily their deaths from COVID-19. Lockdowns are thought to slow the spread of the virus, reducing infections and preventing hospitals from being overwhelmed by rapid increases in the number of critically ill patients.

It is worth noting that the population that is by far the most vulnerable to COVID-19 is the elderly, as well as those with certain existing morbidities. Their life expectancy is unlikely to exceed an additional twenty years. This indicates that in the public health utility calculus, saving millions of lives, even if they are of quite limited extent, is thought to justify significant incursions of individual rights.

It might be thought that infectious diseases are a special case for public health concerns abrogating individual rights. It takes a single ‘super-spreader’ to infect a significant number of people and trigger a major public health crisis[[22]](#footnote-22). Sacrifices made by individuals may prevent harms to the health of many others. However, infectious diseases are not the only scenarios where governments may override individual human rights to help achieve public health goals.

**Other Public Health Issues**

One example is smoking. It is common for governments to legislate bans on smoking in public places, which is a clear infringement on a person’s rights. However, the dangers of passive smoking are well established, and so such bans can be justified on the basis of third-party harm.

Similarly, seat belt laws restrict an individual’s freedom to drive unbelted, but because in Western societies so many people drive and the evidence shows that wearing a seat belt significantly reduces morbidity and mortality[[23]](#footnote-23), mandatory seat belt laws help to prevent car drivers from harming others—both their passengers and those in other vehicles. Of course, these laws also help to prevent adults from harming themselves. However, Holland notes that Mill is clear his principle does not allow for state paternalism[[24]](#footnote-24)—it is restricted to preventing harm to others. Societies do incur significant harms (economic and otherwise) when an individual suffers injury, disease or death, and if a certain risky behaviour is widespread, those costs will be very high. Holland states that ‘it is not obvious that this is the kind of third-party harm [Mill] had in mind’[[25]](#footnote-25).

**Harm versus Rights**

A crucial question is determining what restrictions on individual rights are justified in preventing a certain level of harm. It is widely agreed that smoking restrictions and seat-belt laws are justified as they prevent serious injury, illness and death to third parties, but these restrictions do not seem particularly onerous. As we have noted, the COVID-19 pandemic has resulted in far more severe restrictions to individual liberties, justified by the potential harm that could be inflicted on many millions of individuals, namely their deaths.

Some general guidelines have been developed for public health emergencies such as pandemics, and a widely accepted codification can be found in the UN’s Siracusa Principles[[26]](#footnote-26). Measures must be a last resort, they must be prescribed by law (rather than being arbitrary), the public interest must be compelling, measures must be proportionate to the issue being addressed and finally, they must be necessary measures with no less onerous alternatives. The Siracusa Principles allow for derogation of rights on the basis of public health (‘to take measures dealing with a serious threat to the health of the population or individual members of the population’[[27]](#footnote-27)) and for public safety (‘protection against danger to the safety of persons, to their life or physical integrity’[[28]](#footnote-28)). They also allow for a ‘public emergency which threatens the life of the nation’[[29]](#footnote-29).

In the public health utility calculus, proportionality clearly is linked to the number of lives that are at stake. The more lives that are in danger of being harmed, the more significant the incursions on individual rights may be—provided there are no alternatives. For COVID-19, most public health authorities have concluded short periods of lockdown accompanied by longer periods of restrictions on social gatherings have been necessary to save lives.

**Abortion and Public Health**

Having established that the primary moral theory underlying public healthcare ethics is utilitarianism, and that preventing harm to a target population in the form of increased morbidity and mortality can justify overriding individual rights, let us now consider abortion. In the abortion debate, pro-life proponents argue that abortion is immoral primarily on the basis that fetuses possess the same moral status as children and adults—they are considered persons. Of course, this is a controversial position—most philosophers believe the moral status of a person requires conscious capacities such as self-awareness, desires and rationality, and this excludes the fetus[[30]](#footnote-30).

However, let us explore the implications of the pro-life view with regard to public health ethics. Let us also assume that fetal personhood entails legal recognition by the state. If this were the case, then in terms of public health, we should be just as concerned for the health of fetuses as other persons, and it would be a goal of public health to reduce their morbidity and mortality. Like infants and the elderly, fetuses would also be considered a particularly vulnerable population demographic. Given that there are over 50 million abortions worldwide each year[[31]](#footnote-31), resulting in at least 50 million deaths of fetuses, this clearly would comprise a major public health crisis—annual abortion deaths are roughly equivalent to the *total* number of deaths of infants, children and adults from *all* causes[[32]](#footnote-32).

How would this health crisis compare to COVID-19? The pandemic was predicted to cause the deaths of approximately 40 million people, and so abortion is of similar gravity in terms of the numbers of deaths. However, recall that calculating public health utility requires considering both the years of life saved and how good those years are expected to be[[33]](#footnote-33). On both measures, fetuses are harmed far more than the average COVID-19 victim. Fetuses typically have an entire lifetime ahead of them, while the mortality rate for those with COVID-19 increases steeply for those over 60 years of age[[34]](#footnote-34). The typical fatality had perhaps 20 years of life remaining, and usually suffered from pre-existing medical conditions. By contrast, fetuses have their entire life expectancy ahead; global average life expectancy at birth was 72 years in 2016[[35]](#footnote-35). This implies that *if* fetuses were legally recognised as persons by the state, abortion would have to be considered a far more significant public health crisis than the COVID-19 pandemic in terms of the harm fetuses suffer by being killed. It would justify drastic action to protect this huge and very vulnerable population.

**Protecting Fetuses**

How drastic might the measures taken to protect fetuses be? Because abortion maximally harms millions of fetuses, Mill’s harm principle justifies the abrogation of individual rights for their protection should this be necessary. Abortion also satisfies the Siracusa Principles’ public health and public safety criteria, permitting derogation of rights if required. Whatever measures are taken, the requirement is that the number of abortions be reduced to the extent that abortion is no longer a public health crisis. As a comparison, let us consider the leading cause of death for adults—ischaemic heart disease[[36]](#footnote-36). A 90% reduction in abortion numbers would be required to bring them to a similar number of deaths.

Significantly reducing abortion numbers would require a dramatic change in public behaviour towards abortion. Public education campaigns could be tried to both discourage abortion and to encourage contraceptive use. Governments could also provide generous financial incentives and support to pregnant mothers to encourage them not to have abortions, and continue to do so once children are born to ensure that financial considerations were not an influence on their decision. While such approaches may help to reduce abortion numbers, it seems unlikely that they will have the dramatic effect necessary to deal with such a public health crisis in the short-term. An analogy might be dealing with the COVID-19 pandemic by allocating substantial financial support for vaccine research and development, and expanding healthcare resources to cope, but doing little to prevent the immediate spread of the virus during the interim period before a vaccine is developed.

Complicating prevention strategies is Christine Overall’s contention that the primary reason pregnant women seek abortions is that they do not want a child of theirs to exist that they have responsibility for—they do not want to reproduce[[37]](#footnote-37). For such women, financial incentives to continue with pregnancy seem unlikely to be persuasive, and so the only measure likely to dramatically reduce the number of abortions would be prohibition. This would meet the Siracusa criteria—prohibition is certainly proportionate to the gravity of the issue, and there are no alternatives that are likely to have an appropriate impact. Finally, changing the law to prohibit abortions ensures this is not an arbitrary measure.

So, on the pro-life view that fetuses have the moral status of persons, it seems that public health considerations justify prohibiting abortion. There are, however, a number of objections that could be raised against our contention, and we examine them now.

**Prohibition Fails Objection**

It has been claimed that abortion restrictions do not reduce the number of abortions[[38]](#footnote-38). However, evidence against this is accumulating. For example, a recent comparison of state abortion policies in the United States has shown that restrictive abortion laws result in a significantly lower abortion rate[[39]](#footnote-39). It showed states that have highly restrictive laws have 17% fewer abortions than the median rate, which if applied globally could potentially save million lives each year. In addition, if the results of recent liberalisation of abortion laws are examined, it is clear that this results in significantly more abortions being performed. For example, the Republic of Ireland recently legalised abortion, and overall, the number of abortions has doubled since the law was changed[[40]](#footnote-40). This includes the many Irish women who previously travelled to England or Wales for an abortion. If abortion had also been prohibited in these countries, abortion numbers would have been even lower prior to legalisation in Ireland.

**Illegal Abortions Objection**

A second objection is that if abortion is prohibited, some women might seek illegal ‘back street’ abortions that could result in their being severely injured, perhaps losing their lives. Additionally, maternal mortality could increase due to more births.

The evidence for increased maternal mortality under stricter abortion laws is mixed. Unsafe abortion has been described as a ‘preventable pandemic’, costing 68,000 lives per year worldwide, and is claimed to be highest in countries with legal restrictions on abortion[[41]](#footnote-41). However, when Chile banned abortions in 1989, this did not result in increased overall maternal mortality[[42]](#footnote-42). Poland has some of the most restrictive abortion legislation in the world and yet shares the lowest maternal mortality rates with Greece, Finland, and Iceland at around 3 deaths per 100,000 births[[43]](#footnote-43).

For the sake of argument (and to assume the worst case), let us assume that stricter abortion laws do make a difference in maternal mortality. The ratio for unsafe abortion mortality in countries with restrictive abortion laws is claimed to be 34 deaths per 100,000 births[[44]](#footnote-44). Let us further assume that if abortion were to be restricted worldwide, this ratio would be ubiquitous. On the pro-life view that fetuses have the same moral value as pregnant women, we must compare this figure to abortion deaths per 100,000 live births. Gilda Sedgh et al estimate that worldwide there were 56 million abortions annually worldwide during 2010–14[[45]](#footnote-45). According to the United Nations, there were roughly 82 million births during 2014[[46]](#footnote-46). This translates to roughly 68,000 fetal deaths by abortion per 100,000 births—about 2000 times higher than our unsafe abortion deaths estimate. Clearly, if we treat fetuses as equal to us in moral status, and if restrictions can reduce abortion rates significantly as we suggest above, in terms of public health utility the case for prohibition is overwhelming.

**Kantian Objection**

The Kantian objection to abortion prohibition is based on Kant’s second formulation of his categorical imperative, which requires that people are never treated as mere means, but ends in themselves[[47]](#footnote-47). The claim is that prohibiting abortion treats women merely as incubators or containers for the fetus. Of course, on our hypothetical assumption that fetuses are persons, abortion similarly treats fetuses as mere means rather than ends in themselves, and so there does not seem to be a decisive objection to abortion prohibition on a Kantian basis.

A rejoinder, suggested by Bertha Alvarez Manninen, is that fetuses can never be regarded as *Kantian* persons as they lack moral agency and free will[[48]](#footnote-48), and so the categorical imperative applies only to the pregnant woman. The difficulty with this ‘personification principle’ as Allen Wood points out, is that it excludes many other human beings from humanity, such as infants, small children and those with severe cognitive impairments[[49]](#footnote-49). Kyle Blanchette makes a similar observation[[50]](#footnote-50). In Wood’s view, we should respect rational nature in Kantian persons, but we should also respect beings that show glimpses of rational nature or foreshadow it[[51]](#footnote-51). Wood makes particular reference to children, claiming that it ‘would show contempt for rational nature to be indifferent to its potentiality in children, and to treat children as mere things or as mere means’[[52]](#footnote-52). This argument could easily be extended to fetuses, and so comprises a plausible reply to Manninen. Consequently, the Kantian objection is weakened.

**Unwanted Children Objection**

An anonymous reviewer raised the issue of abortion prohibitions resulting in large numbers of unwanted children. They ask if the state is responsible for raising millions of unwanted children, if parents are unwilling to do so. When abortion laws were relaxed in the United States in the 1960s and 1970s, there was a marked decline in children available for adoption[[53]](#footnote-53), and so it certainly seems possible that stricter abortion laws would result in an increase. However, this would be an increase in children unwanted by their *parents*—it does not entail the state would be required to care for them. State care would only be required if the number of children available for adoption exceeded demand. In wealthier countries, demand exceeds supply and has been driving international adoptions in recent years[[54]](#footnote-54).

Additionally, Fiona Hilferty and Ilan Katz argue that abortion is only one reason for the reduction in children available for adoption—improved economic conditions, contraception, delayed childbearing, increased infertility, and better welfare have all contributed[[55]](#footnote-55). This shift has occurred both in countries receiving international adoptions and those supplying them. It suggests that if restrictive abortion laws were introduced, there would not necessarily be an increase in the number of children the state must care for. In fact, Lisa Gennetian concludes that ‘as abortion laws become more restrictive the total number of unwanted births may decrease[[56]](#footnote-56).

Finally, from a public health ethics perspective, the primary concern is to maximise health utility. Provided public health policies do so, the later consequences must be dealt with as they arise. An analogy might be a pandemic that primarily kills those people aged over 60, similar to COVID-19. Suppose a treatment has been developed that saves most people’s lives, but a high proportion of those saved require long-term care to return to full health (and due to old age, some never do), which is expensive. On a public health basis, we are required to prioritise saving lives by administering the treatment, despite consequences that might incur inconvenience and high costs. Similarly, if we assume the pro-life view that fetuses are persons, we are obliged to act to save their lives—we cannot hold back amid concerns regarding what might happen if too many are saved.

**Thomson and Moral Status**

We have established that on the pro-life view that fetuses are considered persons, there is a compelling case for governments to prohibit abortion on public health grounds, and we have explored various objections, none of which seem likely to prevail in what would be a public health crisis involving over 50 million deaths per annum worldwide. But as one anonymous referee notes, even if this argument is persuasive, most philosophers do not accept the pro-life view of the moral status of fetuses, and so it has no significance for them.

It is true that this argument holds no persuasive power for those who do not hold that fetuses are persons, but they are not its target. Rather, this argument is aimed at Judith Jarvis Thomson’s well-known violinist analogy[[57]](#footnote-57), which presents a major challenge to pro-life arguments based on the moral status of fetuses.

Thomson’s argument is based on a thought experiment that constructs an analogy to pregnancy: a famous unconscious violinist has been attached to your body while you are sleeping by the Society of Music Lovers, because you are the only person whose blood can help him recover from his kidney ailment. His condition requires nine months of treatment, and if you unplug yourself from him, he will die. Intuitively, this seems like an outrageous imposition, and so Thomson argues that no-one is obliged to remain plugged in to the violinist.

Thomson concludes that even if the fetus is a person and possesses a right to life, this does not give the fetus the right to use its pregnant mother’s body for life support. In many cases, she is not morally obliged to continue to offer support because the sacrifices involved are too large. Instead, she can choose to withdraw that support by having an abortion. Thomson also implies that the law should not prevent her from doing so. This is problematic for the pro-life position—if abortion is permissible *even when the fetus is a person*, this severely undermines all pro-life arguments predicated on personhood. Indeed, there has been a concentrated effort over the years since Thomson’s argument was published to refute it[[58]](#footnote-58).

We need not take a position on the cogency of Thomson’s reasoning here. We could even grant for the sake of argument that Thomson *succeeds* in showing that the sacrifices of pregnancy usually do justify the permissibility of abortion[[59]](#footnote-59). However, if it is maintained that the fetus is a person, the prevalence of abortion makes it a public health concern, and this moves it into the realm of public health ethics. On a utilitarian basis, there is a huge decrease in public health utility of the fetus population, based on our calculation that there are 68,000 fetal deaths by abortion per 100,000 births. Of course, there is also a potential decrease in public health utility if abortion is prohibited—a woman may suffer physical and mental harms if she has no option but to continue with her pregnancy. However, on the pro-life view that fetuses are persons, prohibiting abortion clearly prevents an overall large decrease in public health utility.

Further, because the decrease in utility of the fetal population consists of deliberate, maximal harm to the target population, there is a further justification for overriding individual autonomy rights to prevent this harm, based on Mill’s harm principle. From a public health perspective, then, there are additional moral considerations beyond those identified by Thomson that entail a prohibition on abortion is required.

This is a significant result for pro-life arguments that rely on the personhood of the fetus, as Thomson’s argument has regularly been employed to undermine such arguments. We have shown that in a society that values public health, abortion can only be legal if the fetus is thought to possess a significantly lesser moral status than that of children and adults.

**Miscarriage**

We have argued that the pro-life view that fetuses are persons entails that abortion is a public health crisis. This raises the issue of miscarriage. Numerous philosophers have argued[[60]](#footnote-60) that if it is believed that embryos and fetuses have moral status equivalent to children and adults, then miscarriage is a public health crisis that must be prioritised. Toby Ord claims that over 60% of pregnancies miscarry, implying over 200 million deaths annually, significantly more than annual deaths from abortion[[61]](#footnote-61).

Ord’s argument is intended to show that pro-life advocates (who as we have stated generally do believe fetuses to be persons) are hypocritical not to focus their attention on miscarriage rather than abortion. In response, pro-life philosophers have pointed out that a high percentage of miscarriages are not preventable, and shown that induced abortion is the most significant preventable cause of death prior to birth[[62]](#footnote-62) [[63]](#footnote-63). They have, however, acknowledged that miscarriage is an important issue that deserves more attention from pro-life advocates[[64]](#footnote-64).

Clearly, on the view that fetuses are persons, if induced abortion is a public health crisis that requires quite drastic action in the form of abortion prohibitions, it must be agreed that miscarriage is also a public health crisis. It is less clear what should be done about miscarriage, however. We have noted that many miscarriages are not preventable, but in addition, no-one is inflicting deliberate harm on miscarried fetuses, unlike induced abortion. This limits the applicability of Mill’s harm principle in terms of overriding individual rights in order to protect fetuses from miscarriage.

There is one pertinent application here, however. If Ord *et al* succeed in showing miscarriage is a public health crisis (assuming fetal personhood), then clearly induced abortion is also a public health crisis, being of a similar scale. In effect, the argument from miscarriage (intended to undermine the pro-life view), when considered from a public health perspective, helps to justify a prohibition on abortion.

**Conclusion**

Pro-life advocates commonly argue that fetuses have the moral status of persons, and therefore abortion violates their right to life. This view has had to contend with Thomson’s violinist analogy, in which she argues that even if fetuses are persons, abortion is permissible in many cases. However, we have shown that *if* fetuses are considered to be persons, abortion constitutes a significant public health crisis. Consequently, widely accepted public health ethical principles justify overriding individual rights to bodily autonomy in order to prevent maximal harm to the population of fetuses. We conclude if fetuses are persons, public health considerations require that abortion is prohibited. Abortion can only be tolerated in a society that values public health if fetuses are not regarded as persons.

1. For a detailed ethical discussion of compulsory vaccination, see: Giubilini, A. (2019). *The Ethics of Vaccination*. Palgrave MacMillan. [↑](#footnote-ref-1)
2. For ease of use, we use the term ‘fetus’ to refer to all stages of development after fertilisation. Technically, fertilisation begins with a zygote, which divides to become a blastocyst. From the second to the eighth week after fertilization, it is referred to as an embryo, and thereafter until birth, the fetus. [↑](#footnote-ref-2)
3. Thomson, J.J. (1971). A Defense of Abortion. *Philosophy & Public Affairs* 1(1): 47-66. [↑](#footnote-ref-3)
4. Greasley, K (2017). *Arguments about Abortion: Personhood, Morality, and Law*. Oxford: Oxford University Press. [↑](#footnote-ref-4)
5. Bayer, R., & Fairchild, A. L. (2004). The Genesis of Public Health Ethics. *Bioethics*, 18(6), 473–492. [↑](#footnote-ref-5)
6. Kass, N. E. (2001). An Ethics Framework for Public Health. *American Journal of Public Health*, 91(11), 1776–1782. [↑](#footnote-ref-6)
7. Holland, S. (2014). *Public Health Ethics*, Polity Press. p.20. [↑](#footnote-ref-7)
8. *Ibid*. p.18. [↑](#footnote-ref-8)
9. *Ibid*. p.56. [↑](#footnote-ref-9)
10. Savulescu, J., Persson, I., & Wilkinson, D. (2020). Utilitarianism and the pandemic. *Bioethics*, 34(6), 620–632. [↑](#footnote-ref-10)
11. Bayer, R., & Fairchild, A. L. (2016). Means, ends and the ethics of fear-based public health campaigns. *Journal of Medical Ethics*, 42(6), 391–396. [↑](#footnote-ref-11)
12. Kass, N. E. (2001). An Ethics Framework for Public Health. *American Journal of Public Health*, 91(11), 1776–1782. [↑](#footnote-ref-12)
13. Gibbard, A. (1984). Utilitarianism and Human Rights. *Social Philosophy and Policy*, 1(2), 92–102. [↑](#footnote-ref-13)
14. Mill, J. (2011). *On Liberty* (Cambridge Library Collection - Philosophy). Cambridge: Cambridge University Press. doi:10.1017/CBO9781139149785. p. 22. [↑](#footnote-ref-14)
15. On an individual basis, it might be thought that Mill’s harm principle implies abortion is impermissible if the fetus is a person, and so there is no need to resort to public health ethics. However, the same reasoning also implies that the unconscious violinist cannot be disconnected—and as we have seen, Thomson’s argument shows that the violinist lacks the right to continued life support *despite* the harm he suffers by being disconnected. So, Mill’s harm principle does not prevent disconnection of the violinist or the fetus (provided Thomson’s reasoning is accepted). [↑](#footnote-ref-15)
16. Solberg, C. T., & Gamlund, E. (2016). The badness of death and priorities in health. *BMC Medical Ethics*, 17(1). [↑](#footnote-ref-16)
17. Kamm, F. M. (2013). Bioethical Prescriptions. Oxford University Press. p. 378. [↑](#footnote-ref-17)
18. Marineli, F., Tsoucalas, G., Karamanou, M., & Androutsos, G. (2013). Mary Mallon (1869-1938) and the history of typhoid fever. *Annals of Gastroenterology*, 26(2), 132–134. [↑](#footnote-ref-18)
19. Walker, P. et al. (2020). Report 12: The Global Impact of COVID-19 and Strategies for Mitigation and Suppression. Imperial College COVID-19 Response Team.

    https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/report-12-global-impact-covid-19/. Accessed 26 April 2020. [↑](#footnote-ref-19)
20. Ferguson, N.M. et al. (2020). Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. Imperial College COVID-19 Response Team.

    https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/report-9-impact-of-npis-on-covid-1 [↑](#footnote-ref-20)
21. Pfefferbaum, B., & North, C. S. (2020). Mental Health and the Covid-19 Pandemic. *New England Journal of Medicine*, 383(6), 510–512. [↑](#footnote-ref-21)
22. Lin, J., Yan, K., Zhang, J., Cai, T., & Zheng, J. (2020). A super-spreader of COVID-19 in Ningbo city in China. *Journal of Infection and Public Health*, 13(7), 935-937. [↑](#footnote-ref-22)
23. Crandall, C. S., Olson, L. M., & Sklar, D. P. (2001). Mortality Reduction with Air Bag and Seat Belt Use in Head-on Passenger Car Collisions. American Journal of Epidemiology, 153(3), 219–224. [↑](#footnote-ref-23)
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25. Holland, S. (2014). Public Health Ethics, Polity Press. p.106. [↑](#footnote-ref-25)
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