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Is pregnancy a disease? A normative approach

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ABSTRACT

In this paper, we identify some key features of what makes something a disease, and consider whether these apply to pregnancy. We argue that there are some compelling grounds for regarding pregnancy as a disease. Like a disease, pregnancy affects the health of the pregnant person, causing a range of symptoms from discomfort to death. Like a disease, pregnancy can be treated medically. Like a disease, pregnancy is caused by a pathogen, an external organism invading the host's body. Like a disease, the risk of getting pregnant can be reduced by using prophylactic measures. We address the question of whether the 'normality' of pregnancy, its current necessity for human survival, or the value often attached to it are reasons to reject the view that pregnancy is a disease. We point out that applying theories of disease to the case of pregnancy, can in many cases illuminate inconsistencies and problems within these theories. Finally, we show that it is difficult to find one theory of disease that captures all paradigm cases of diseases, while convincingly excluding pregnancy. We conclude that there are both normative and pragmatic reasons to consider pregnancy a disease.

INTRODUCTION

Imagine a patient who visits the doctor having an abdominal mass that is increasing in size, causing pain, vomiting and displacement of other internal organs. Tests are booked, and investigations are planned. But when the patient mentions that she has missed her period, these alarming symptoms suddenly become trivial. She is pregnant! No disease, nothing to worry about. But is this the right way to think about things?

What counts as a disease is a recurring question in philosophy of medicine. Experts disagree about the criteria by which we can distinguish diseases from other phenomena.¹ Some believe that diseases can be defined with reference to some objective truth, others that the term is purely or partly socially constructed. Whichever view one takes, it is difficult to find a theory that accommodates all those conditions we take, intuitively, to be diseases, while excluding all those that, intuitively, we do not. We argue that there are several pragmatic reasons—based on a combination of biological, social and normative considerations—to classify pregnancy as a disease.

HARMFUL SYMPTOMS

Diseases are harmful. They cause suffering and are bad for the health of the person who experiences them. Commonly, though, in a wanted pregnancy, we focus on the longed-for child rather than whatever harms the pregnant woman may experience. The risks of pregnancy may appear negligible or

insignificant in this context. The harms of pregnancy are often transient, and most pregnant women survive the experience. Fear of becoming pregnant is in itself regarded as a pathological condition—'tokophobia'—that may require medical treatment.² Pregnancy also has some medical benefits. Some women who suffer from rheumatoid arthritis report improved symptoms during pregnancy.³ Carrying a pregnancy to term early in life can reduce the lifetime risk of breast cancer.¹ Pregnancy, of course, also has subjective benefits; we discuss these in our section on subjective value.

Two questions emerge here. First, how do the risks of pregnancy compare with those of other conditions that are regarded as bona fide diseases? And second, are health risks themselves a sufficient basis on which to designate a condition as a disease?

In order to answer the first question, we can compare pregnancy with measles. Measles is uncontroversially regarded as a disease and treated as such by public health authorities and health professionals. Measles is harmful to nearly all of those who catch it. However, most patients will survive. Very few will die, and only a small proportion will go on to experience longer term impacts on their health. So how do the risks of pregnancy compare against those of measles?

Like measles, pregnancy is a self-limiting condition. It follows a predictable trajectory that usually ends in the patient's recovery. Both pregnancy and measles also involve symptoms that can impair one's normal functional ability. Common symptoms experienced during pregnancy include: back pain, bleeding gums, headaches, heartburn and indigestion, leaking from the nipples, nosebleeds, pelvic pain, piles, stomach pain, stretch marks, swollen ankles, feet and fingers, tiredness and sleep problems, thrush, vaginal bleeding, vaginal discharge, vomiting, morning sickness and weight gain.⁴ Like many diseases, including measles, pregnancy is a condition that has distinct stages.⁵ The first stage of pregnancy commonly involves many of the symptoms described above. The second stage—labour—will usually involve extreme pain, powerful cramps, and the ripping, stretching and damaging of tissue. This second stage is far riskier than the first, in terms of long-term threats to life and health.⁶

What about mortality rates? Here, we can compare the lifetime risk of dying from measles with the lifetime risk of dying from pregnancy-related harms. The WHO states 'A woman's lifetime risk of maternal death is the probability that

¹Although pregnancy later in life can increase the risk of breast cancer, and some forms of breast cancer are in fact directly caused by pregnancy. See for example Alfasi A, Ben-Aharon I. Breast cancer during pregnancy—current paradigms, paths to explore. *Cancers*. 2019 Oct 28;11:1669



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a 15-year-old woman will eventually die from a maternal cause. In high income countries, this is 1 in 5400, vs 1 in 45 in low-income countries.⁷

The risk of dying should one catch measles is around 1 in 5000. However, the lifetime risk of dying from measles is not simply 1 in 5000—it is far less than this, largely because vaccination programmes have diminished the likelihood of contracting measles during one's lifetime. The incidence of measles has diminished in the USA, for example, to less than one per million.⁸ Of these one per million who contract measles, only 1 in 5000 will die. Thus, the lifetime risk of dying from measles in a country with an effective vaccination programme is 1 in 5000×1000000. The same source notes that prior to vaccination, almost everyone would expect to be infected with measles at some point during their lifetime. In this case, the lifetime risk of dying from measles would be more or less identical with the 1 in 5000 chance of dying should one catch measles, since catching it becomes almost a certainty.

On this basis, the lifetime risk of dying from pregnancy-related causes is dramatically higher than the lifetime risk of dying from measles in countries with a vaccination programme. This is true despite the fact that those countries are also likely to be the ones that have effective maternity health services. If we compare the risks of pregnancy in countries without such services with the risks of measles in countries without vaccination programmes, the picture is even starker. The lifetime risk of dying in childbirth in low-income countries is 1 in 45.⁷ And the lifetime risk of dying from measles would approach 1 in 5000. With or without effective health services, the lifetime risk of dying of childbirth significantly outweighs that of dying from measles.

However, unlike measles, pregnancy is a condition that affects only a certain group of people: those with female reproductive organs. Perhaps this partly explains why the risks involved in pregnancy are higher in places where women's rights and independence receive less social and legal protection.

If medical services are not available, many pregnant people will be seriously injured as a result of second-stage pregnancy, and a significant number of them will die. The WHO states: '[a]ll women need access to high quality care provided by competent skilled health professionals during pregnancy [...] It is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death.'⁷

However, many people do not regard pregnancy as a disease; indeed, the idea that it might be thus construed is highly contentious.^{9,10} If pregnancy is not a disease despite its risks, then there must be some additional factor to take into account. One such consideration might be the degree to which the condition is valued.

SUBJECTIVE VALUE AND THE UNWANTED PREGNANCY

Pregnancy is often a cause for celebration. It can give people's lives meaning, and is a source of intense fulfilment and profound significance for many individuals. Pregnant women are popularly said to be 'blooming'. Nevertheless, as Iris Marion Young points out, those who are privileged enough to regard pregnancy as a choice are in a minority. For most of the world's inhabitants, there is nothing voluntary about pregnancy, and women may be very far from celebrating each pregnancy they experience.¹⁰

Unlike measles, pregnancy is a condition about which people may take a variety of views. One may be dismayed or overjoyed to be pregnant. These subjective responses might seem to disqualify pregnancy from being classified as a disease. Typically, people

think of the classification of disease as being an objective, scientific endeavour, but some philosophers hold that it is primarily a matter of value. Rachel Cooper, for example, proposes that to be classified as a disease, a phenomenon—P—must satisfy three conditions.¹¹ These conditions are:

1. P is bad for the person who suffers from it.
2. The sufferer is unlucky to suffer from P.
3. P can be treated medically.¹¹

Cooper notes that her approach could indicate that unwanted pregnancy counts as a disease. However, our aim is to establish whether pregnancy itself can be construed as such, irrespective of whether it is wanted. Here, therefore, we take a closer look at how a wanted pregnancy might fare in regard to Cooper's three criteria above.

Cooper's first condition requires that P is bad for the sufferer. Diseases may be bad for the sufferer in a variety of ways. Most obviously, they may cause pain and suffering, increased risk of long term health complications and shortened lifespans. Insofar as pregnancy also causes pain, suffering, etc, it seems that we may indeed say that it is 'bad' for the person who experiences it. But do wanted pregnancies have these effects?

A person who is happy to be pregnant may welcome even unpleasant symptoms such as stretch marks and nausea. The pain of childbirth may be treated as a badge of honour. Perhaps then, the 'badness' component of pregnancy can simply be disregarded in such cases. If so, a wanted pregnancy is not a disease, whatever its impact on a person's health. However, for consistency, this might imply that in other cases where a person finds value in their experience, they can no longer claim to have a disease. There is a wealth of qualitative research showing that sufferers often ascribe value to their experience of conditions that are uncontroversially regarded as being diseases, such as cancer and heart disease.^{12–15} If we then conclude that for such people their condition is no longer bad for them, and thus that they do not have a disease, this implies a very rigid and binary understanding of the relationship between subjective value and disease. People either value P, in which case it is not a disease, or they do not value it, in which case it may be a disease.

In reality, people's subjective beliefs and values are not fixed in this binary way. Therefore, if values play a role in classifying disease, we should not expect this to yield a neat, reliable distinction between what constitutes a disease and what does not. A more plausible way of accommodating value is to acknowledge that the experience of valuing some aspect of P does not necessarily conflict with P's badness for the sufferer in terms of the objective harms and risks as outlined above. Accordingly, a wanted pregnancy may qualify as a disease on this interpretation.

Moreover, it is worth emphasising that pregnancy commonly causes far more risky and unpleasant symptoms than those we have listed above. The idea that pregnant women should regard pain, nausea and stretch marks with joy may be understandable. But pregnancy frequently involves far more serious risks. It is for this reason that the WHO, as noted above, emphasises that medical care makes the difference between life and death for birthing women.⁷ In a world in which misogyny and pronatalism continue to exercise powerful sway, it is not implausible that even serious risks and injuries may be viewed by pregnant and

¹¹Each condition is necessary; jointly they are sufficient to mean that P is a disease.

non-pregnant people alike as a mark of suitability for motherhood: a confirmation that the prospective mother is prepared to accept suffering as her lot.

Because of this, we suggest that it is vital to think carefully about the social conditions that inform a patient's perception of P, before endorsing too eagerly the idea that subjective value is what makes P a disease or not. Finally, it is worth noting that in the old days of medicine, many patients diagnosed with 'diseases' such as homosexuality or immorality fully endorsed the idea that they were indeed sick; that these conditions were 'bad' for them. Again, this calls into question the relationship between subjective perceptions, and the designation of something as a disease. Vulnerable and disadvantaged social groups are often pressured to categorise their experiences in ways that fit in with social norms. Where these categorisations result in further disadvantage or vulnerability, we should regard them with suspicion. We discuss this in more detail in our section on medical practice, below.

Cooper's third condition is that P can be treated medically. This condition is fully met by pregnancy, whether wanted or not. Where services are available, pregnancy is the focus of intense medical attention and often intervention. Again, we discuss this further in our section on medical practice.

We now turn to Cooper's more challenging second condition. Does it make sense to regard a wanted pregnancy as being 'unlucky' for the pregnant person? As we have noted, many people regard themselves as fortunate when they become pregnant. But is this the end of the story? There are occasions where conditions are actively sought, in circumstances where one might feel lucky to have caught them, and where this does not intuitively challenge their disease status. Some common diseases, such as chickenpox and measles used to be regarded in this way.¹⁶ To draw on a more recent example, many people who contracted the milder omicron version of COVID-19, after having been fully vaccinated, felt themselves fortunate to have done so.¹⁷ Another example might be that of courting disease in order to escape the draft.¹⁸

Perhaps, though, we can still regard these sufferers as being unlucky to suffer from P, even though they have actively sought it. Those who seek P in order to avoid the draft, or some worse version of P are choosing what they believe to be the lesser of two evils. The sufferer could still be viewed as unlucky in one of two ways: first, insofar as they are in an invidious position, and are obliged to choose between two unpleasant things, or second because P is still bad, even in cases where it is less bad than the alternative.

So how might this apply to the wanted pregnancy? We suggest that a wanted pregnancy can be seen in at least some cases as the lesser of two evils. In this case, the greater evil is childlessness. A woman might be lucky to become pregnant, if she longs to become a mother and sees no other way to achieve this. But she is unlucky that pregnancy, like COVID-19 and chickenpox, is objectively threatening to her health. And she is unlucky to be in a position where pregnancy—with all its risks—appears to be her only route to motherhood.¹⁹

It might be objected here that some women specifically want to experience pregnancy as part of what is entailed by motherhood. They do not regard pregnancy as the lesser of two evils, but as a valuable experience in its own right. However, as long as pregnancy is the only route to reproduction for most women, it is difficult, if not impossible, to gauge the value of pregnancy in its own right. To push this further, one might consider how doctors or friends and family ought to respond to someone who became

pregnant purely in order to experience pregnancy, without any intention of parenting the child, and independently of any additional motive, such as wanting to facilitate the parental wishes of others, via surrogacy. We suggest that in such a case a person's wish to be pregnant might seem pathological.

If one accepts this, it follows that in many, perhaps most cases of wanted pregnancy, the 'sufferer' is unlucky insofar as she is obliged to undergo the associated risks in order to achieve the good she seeks. As suggested above, this does not conflict with the idea that she may nevertheless place significant value on her experience of pregnancy.

MEDICAL PRACTICE

Some philosophers suggest that disease is simply what is treated as such by the medical community.²⁰ This account goes beyond Cooper's approach, in which the possibility of treating P medically only indicates that P is a disease if her other criteria are also met. A purely relativist approach requires no additional criterion or justification. This is the same kind of argument as that we can identify art simply by observing what is treated as 'art' in the art world.

In this section, we consider how compelling this criterion is as a full or partial definition of disease, and think about how far a wanted pregnancy might fulfil this requirement.

Although pregnancy is not formally classified as a disease per se in modern medical practice, in many ways it is treated as such. Preventive medicine employs a variety of methods to stop pregnancy from occurring, including the provision of condoms, prescription of hormonal birth control pills, insertion of intrauterine devices, injection of hormonal contraception, and surgical removal or restriction of the reproductive organs. In cases where pregnancy has already occurred, abortion may be regarded as a form of medical treatment that aims to 'cure' the condition by preventing it from progressing to the more aggressive second stage. In this sense, the avoidance of pregnancy is a fairly routine and unexceptional aspect of medical practice in jurisdictions where contraception and abortion are available.

In cases where pregnancy is wanted, or where contraception and abortion are not available, pregnancy is still the focus of considerable medical attention and intervention. Pregnant women are expected to attend clinics or hospitals as a matter of course in order to facilitate medical surveillance. The pregnant woman's lifestyle choices are carefully tracked. Her weight, diet and exercise habits, alcohol, drug and tobacco consumption become a matter of intense medical scrutiny.

It is commonly regarded as a matter of urgency to ensure that a birthing woman has access to medical care. Interventions of various degrees of invasiveness may be employed: forceps and other mechanical aids, drugs, surgical removal of the baby. Pregnant women who refuse medical interventions deemed necessary for their baby's health are commonly regarded as immoral or irrational. Even in jurisdictions where adults' right to refuse medical treatment is legally protected, a pregnant woman is likely to experience invasive interventions in circumstances where robust consent protocols are either not possible, or are not regarded as being necessary.^{21 22} Conversely, where women request interventions for their own health or welfare in the birthing context, they may be regarded as whiny or selfish, and such interventions may be delivered late, brusquely or withheld.^{23 24}

After the birth, most women will need time to recover from the immediate effects of the delivery. Many will experience ongoing, perhaps lifelong complications, requiring further

medical interventions; surgical repair of prolapse, for example, or treatment for incontinence.

Thus, if we define a disease simply as something that medicine regards as an appropriate target for attention and/or intervention, it seems that pregnancy is indeed treated as a disease, even though it is not explicitly classified as such. However, there is a strange selectivity about medicine's treatment of pregnancy. Pain and debilitating symptoms experienced by the woman are not always regarded as a basis for medical intervention in ways that they would be in other contexts. In contrast, if the fetus is at risk (and some aspects of medical treatment seem to suggest that being in a uterus is in itself a situation of inherent risk),²⁵ health professionals find it much easier to move into disease mode, whereby the fetus' location in the woman's body becomes pathological. In short, pregnancy is in some respects treated like a disease that threatens the fetus' health, and to a lesser extent like a disease that threatens the woman's health.

A further complication here is that in some respects, the non-pregnant body is regarded as being diseased. In the context of fertility treatment, an otherwise healthy body is subjected to a range of painful and invasive medical interventions, in order to bring about a condition that causes all the risks and symptoms described in our first section above.²⁶ Another potentially counterintuitive example is that of elective vasectomy. Effectively, this treats male fertility as a disease.

The treatment of pregnancy in medical practice is thus contradictory. To bring about a pregnancy is an explicit goal of medicine in some cases. Pregnancies, once established, are both overtreated and undertreated. Pregnant women are expected to bear a degree of pain and suffering that would merit treatment in other medical contexts, without complaint or remedy. The gestating fetus, however, is regarded as being exquisitely vulnerable and in need of extensive medical surveillance, control and intervention.

To reformulate this in Cooper's terms, medics expend time, energy and resources on attempting to bring about P. They also spend time and effort trying to prevent P. When P is established, they then go on to treat P as a worrying state of affairs, requiring medical intervention. P is both a disease and not a disease!

The medical practice approach thus seems unsatisfactory. On an anthropological level, it may be illuminating. But the question we are asking is partly normative: should P be regarded as a disease? Like moral relativism, medical relativism not only fails to help with normative questions, it makes it difficult to articulate such questions.

What we are willing to consider disease is influenced by historically and culturally relative values. Conditions such as 'drapetomania' and 'hysteria' were once classified as diseases.²⁷ Homosexuality was treated as a disease up to fairly recently in orthodox western medicine. Now we know better. There simply is no condition such as 'hysteria' in which the womb leaves its usual place and rampages around the body, causing havoc. Other conditions are not so clearly based on mistaken facts, but seem to derive their disease status from a combination of facts and social values. Drapetomania, for example, was a condition that affected slaves in the slave-owning parts of the USA. Its main symptom was a compulsion to run away, which was unamenable to any threats of punishment. In the context of a slave-owning society, this phenomenon was regarded as a bona fide disease. Likewise, homosexuality is not a mere figment of the imagination. It is plausible that heterosexual people are biologically different in some way from gay people. But societies' categorisation of this difference as a disease reflected a moral conviction—that it is wrong to be gay.

If we are to have the conceptual tools to argue for or against the categorisation of any condition as a disease—and these examples surely show that we do need such tools—then the purely descriptive approach is unsatisfactory.

DYSFUNCTION

We have shown that pregnancy is harmful (like measles). Like measles, pregnancy is also caused by an externally originating organism that enters the body and causes the harmful results we have described. Accordingly, on this view, sperm could be seen as a pathogen in the same way that the measles virus is. Measles and pregnancy can also be medically treated, prevented, cured or managed. Measles is more likely to be viewed as a misfortune, while (a wanted) pregnancy may be a cause for rejoicing, but as we have suggested, this is not a sufficient basis on which to make a robust distinction between the two in terms of their disease status.

However, there is an important common-sense difference between pregnancy and measles. Measles is a problem: an indication that something has gone wrong. Proponents of dysfunction accounts of disease, such as Wakefield,²⁸ suggest that dysfunction is a necessary aspect of what we view as a disease. Dysfunction is something that deviates from the way an organism is supposed to be. In turn, this causes suffering or harm. Suffering or harm alone, in the absence of such dysfunction does not count as a disease.

Measles is dysfunctional. In contrast, it is commonly regarded as a mark of a healthy body that it can become pregnant. It is this, perhaps, that justifies the use of medical intervention to bring about pregnancy, despite the fact that it will put the 'sufferer's' health at risk. Remedying dysfunction is the appropriate business of medicine, and that which is not a dysfunction cannot be a disease.

It is clear that the concept of dysfunction plays an important role in a common-sense understanding of disease. But this also gives rise to a number of very complex and perhaps insurmountable problems. This, after all, is why philosophers such as Cooper and others, look for an account of disease that does not rely on ideas of how an organism ought to function.

Dysfunction is defined in relation to its opposite. When something is dysfunctional, it is performing wrongly; it is not behaving in accordance with the intention of the designer. But this seems to presuppose that there is a right way to perform, or a design, and that this design is perceptible to us. In other words, this is a way of understanding disease that seeks to base its classifications in objective facts about how an organism should behave. But the concept of healthy functioning itself demands a normative evaluation. It goes beyond being merely descriptive. In contrast with Cooper's subjective approach, the evaluative element is baked in at a far removed level from the lived experience of the sufferer. Instead, experts make these judgements, and patients and practitioners accept them and act accordingly. It is fundamentally elitist.

The dysfunction approach is also problematic in a more basic way. That is, it derives an 'ought' from an 'is'. The expert observes the phenomena in question, theorises and then makes his pronouncement as to how the organism should behave. This leap from the descriptive to the normative is enormously problematic.²⁹ And this problem seems insurmountable for anyone who would try to base an understanding of disease on concepts of dysfunction.

The question of what constitutes good functioning is not obviously one that we can divine simply from observing the behaviour

of an organism, or studying biology or chemistry, or from theorising about these phenomena. The notion of proper functioning borrows from a teleological view of biological organisms, or alternatively, from the belief that there is indeed a designer. Can we really expect to recognise how an organism should be? Does it even make sense to suppose that there is a 'right' way for an organism should function? Typically, most educated people believe that humans evolved, along with all other species, as a product of a long series of random genetic reshufflings. We are not the product of a loving, careful intelligent designer. That our bodies work in a particular way is not an indication of how they 'should' be, but is simply an indication that at some point in our past, these traits were not incompatible with our ongoing survival in the environments we inhabited.

NORMAL SPECIES FUNCTION

As we have shown, in terms of health risks, symptoms and medical treatment, pregnancy shares many features with conditions that we regard as being diseases. Yet pregnancy is not usually considered a disease despite these similarities. This is partly because pregnancy is not regarded as dysfunctional. However, as we suggest, it is a mistake to rely on concepts of dysfunction as a mode of classifying phenomena. Our suggestion here is that we set aside the notion of dysfunction, and turn to the question of normal function. Normal functioning is a descriptive concept that allows for a purely fact-based understanding of disease. So does this make a difference for the way we should understand pregnancy?

The concept of 'normal species function' has been used by some writers in order to distinguish what should or should not be classified as disease.³⁰ We tend to think of pregnancy as a normal aspect of human life in a way that measles, for example, is not. But what does 'normal species function' really mean here? Most humans are not capable of becoming pregnant. Moreover, in many species, including humans, it is not 'normal' for every individual to reproduce. Male pheasants which do not establish territory tend not to mate. Groups of primates often contain only one sexually active male.³¹

Pregnancy is not normal for men, nor girls under 11 or women over 51. But what if we narrow down to consider only those of 'reproductive age', that is, 15–49?ⁱⁱⁱ Is pregnancy normal for this group? Currently, there are approximately 1.8 billion such women in existence.³² But there are only around 211 million pregnancies yearly.³³ Thus, the norm for people in this group is not to be pregnant. Based purely on numbers, pregnancy is abnormal, even within the narrowest target group we can define. So can we really insist that pregnancy constitutes 'normal species function' when most of the people in the target group are not pregnant?

BOORSE'S BIostatistical THEORY

Among the theorists who claim that health and disease can be defined in ways that are free of extraneous assumptions or values, Christopher Boorse's biostatistical theory (BST) is perhaps the

most prominent.³⁴ Boorse eschews the idea that normatively laden understandings, or values are necessary for the identification of disease. What matters is pure statistics. Thus, on Boorse's approach, phenomena that are statistically typical within certain categories, for example, sex and age, are healthy for the individuals concerned.

As we have shown, being pregnant is not normal for any reference class, however, narrowly we define it. But for Boorse, considerations of '...survival, reproduction, organism, part, process, species, sex, age and causation'³⁵ are also to be taken into account. On this basis, it looks as if pregnancy can indeed be considered 'normal' even though most people are not pregnant. Interestingly, this aspect of Boorse's approach means that homosexuality is classified as a disease. Even if more people were homosexual than heterosexual, homosexuality—it is assumed—is not compatible with reproduction.

If we accept Boorse's view, we cannot argue that pregnancy itself is a disease. Indeed, perhaps nothing could be classified as a disease, provided that it contributes to survival and/or reproduction. Here, some other challenges emerge. We have already noted that homosexuality is straightforwardly a disease on Boorse's account. Seemingly, menopause could also qualify as a disease, despite the fact that it is a near-universal phenomenon for women who live beyond 50. Menopause impedes an individual's fertility for several decades of their lifespan. Of course, Boorse might argue, as have various evolutionary theorists, that the menopause frees women from direct reproductive labour, in order to make them available for grandmothing duties.³⁶ In fact, similar arguments have been made to support the reproductive and survival value of homosexuality.³⁷

However, a problem with this kind of explanation and justification is that the essence—the statistical part of BST seems to lose its significance. Instead, we have an appeal to statistical normality within a set of very normatively laden parameters.³⁸ Moreover, in a social species such as humans, social factors influence reproductive behaviour, not mere biological fertility. We are a technological species; we harness tools to further our ideological goals. Thus, while homosexual people and postmenopausal women cannot conceive 'naturally', they can and do produce offspring in today's society, with technological help.

Boorse's approach means that disease status is not intrinsic to any specific phenomenon, but arises from its circumstantial relationship with the individual it pertains to, and the environment in which that animal finds itself. Humans are animals that have extraordinary abilities to manipulate and adapt their environments. Therefore, what encourages or hinders reproduction is subject to change.

Setting this aside for now, it seems that there are ways in which the BST may still fail fully to protect pregnancy from disease status. For example, if pregnancy is no longer necessary for reproduction, its health/disease status comes back into question. This might seem a fanciful point to raise. However, developments in biomedical research have led experts in recent years to question whether pregnancy is inevitably and inexorably a necessary part of human reproduction.^{39 40} Human trials in 'extracorporeal uteruses'—or artificial wombs—are currently being planned, as a follow-up to the successful gestation of lambs in 'biobags'.⁴¹

An additional challenge arising from Boorse's approach is that contraception, education, and gender equality are very clearly correlated with fewer pregnancies. Perhaps rather than construing pregnancy as a disease, we should regard women's liberation as pathological, and the use of contraception (despite its popularity) as fundamentally diseased. Boorse's analysis

ⁱⁱⁱThe WHO specifies 'reproductive age' as 15–49. Women can, of course, have babies outwith these parameters, but reproduction at the earlier or later reaches of female fertility is widely regarded as being undesirable or unusual, or both. See WHO. Women of reproductive age (15–49 years) population (thousands). World Health Organisation 2023. Available at [https://www.who.int/data/maternal-newborn-child-adolescent-ageing/indicator-explorer-new/mca/women-of-reproductive-age-\(15-49-years\)-population-\(thousands\)](https://www.who.int/data/maternal-newborn-child-adolescent-ageing/indicator-explorer-new/mca/women-of-reproductive-age-(15-49-years)-population-(thousands)) (last accessed 16th November 2023)

also leaves us in a difficult position as regards abortion. In this context, survival and reproduction are profoundly at odds: a woman who is in the first trimester of pregnancy is statistically more likely to survive if she has an abortion than if she continues with the pregnancy. So is it abortion or pregnancy that is pathological here, or both, or neither?

A final problem with Boorse's BST and the normal species function account is that they cannot easily account for factors that may connect reproduction and survival in negative ways, whether at the individual or the species level. As we have shown, reproduction is risky for human females at the individual level (perhaps this is one reason for the plummeting birth rates in countries where women are able to choose whether and when to reproduce). Risks to individuals cannot be entirely separated from those to the species itself. Species evolve and become extinct for many reasons. In some contexts, a species' reproductive habits may not be conducive to longer-term survival, and ultimately, the species dies out. In this case, reproduction is not obviously 'healthy', since it leads the species towards extinction. An example of this is, for example, sexual selection that leads to unwieldy antlers in deer, or tail feathers that are incompatible with flight in birds.⁴²

Could something like this also happen to humans? We are a species that has been around for an extraordinarily short period of time in evolutionary terms. Human childbirth is significantly more painful, protracted, and lethal than delivery in other mammal species. As noted, gender equality leads to plummeting birthdates, perhaps precisely because human birth is so traumatic for the human body, and is incompatible with many other goods that humans value. We cannot infer from our existence now that we are equipped to survive indefinitely, nor that reproduction will continue as we know it.

INFERTILITY AS A DISEASE

Recently, considerable attention has been given to the question of whether infertility is a disease. Many of the same considerations have been raised, as those that we discuss here. Kukla's analysis is highly relevant for our exploration here, although we argue, as it were, from different ends of the fertility spectrum.⁴³ Kukla notes that to classify something as a disease brings it into a certain domain: it can be researched, treated; those who have it are 'sufferers' or patients and have an implicit claim on our health resources, our concern, and perhaps even our compassion. Equally, of course, as we note above, there are risks in designating something as a disease. It may serve to entrench social disadvantage, and feed into harmful stereotypes. At the most extreme, the rhetoric of health and disease can be a feature of genocidal ideologies such as those embraced by the Nazis.

Kukla suggests that to designate something as a disease cannot be done on a purely factual or neutral basis, as Boorse attempts to do. In determining whether X as a disease, or not a disease, we need to engage with the question of what level of risk is acceptable. In other words, how bad would it be if we mis-classified it?

Interestingly, there seem to be considerable benefits associated with the classification of infertility as a disease. Most significantly, of course, it would suggest, as Kukla says, that infertility merits treatment. Those who suffer from infertility thus have a strong reason to prefer that infertility is treated as a disease. Yet to designate a phenomenon as a disease, we need to be clear about what it is that we are referring to. In her analysis, Kukla notes that there is no standard, universally accepted definition of infertility. Those definitions that do exist are full of contradictions and tensions: an 'epistemic mess'.

According to Kukla, the focus in classifying infertility as a disease is not based on medical or scientific precision or epistemic serviceability, but ways of reinforcing certain values, and pathologising certain narratives that go against these values. All diseases, on Kukla's view, are associated with value to a certain degree. But what marks out infertility in particular is that other diseases which are also attached to social values, can be reliably associated with independent features. Breast cancer, for example, is not just a product of how one feels, but also comes with an identifiable set of objective physical characteristics that can be measured and verified empirically. In contrast, the disease of infertility exists only in relation to a particular wish: the wish to have a child. Without this, a person (or couple) may never even realise that they are infertile.

We agree with Kukla that the classification of infertility as a disease is epistemically problematic. Infertility is treated as a disease not because of its objective physiological or scientific features, but because of social norms that incline us to think people should have children. Here, we push Kukla's reasoning further to suggest that there is a corresponding failure of the medical establishment, society and philosophers, to pathologise pregnancy itself. This is the flip side of the coin that Kukla presents.

Kukla gives four grounds on which we should be critical about the classification of infertility as a disease. These are:

1. Conflict and inconsistency between definitions.
2. Lack of any unified physical syndrome.
3. The risks are social rather than medical.
4. The risks are only 'risks' within a particular set of social values.

We can apply these to pregnancy in reverse, so to speak. For Kukla, to classify infertility as a disease is problematic because it fails on these four points. Accordingly, by implication, phenomena that perform well on these criteria are more convincingly to be understood as diseases.

To take the first criterion: Kukla rightly notes the variability in definitions of infertility. In contrast, there is very little inconsistency in the definition of pregnancy. A common joke is that one cannot be 'a little bit' pregnant. Moreover, pregnancy is objectively verifiable; it is binary in the way that Kukla says cancer is^{iv}—one either is pregnant or not. The question of whether one is pregnant does not depend on how the person feels about it, unlike infertility, into the definition of which, the wish for a child is written. The risks of pregnancy are *medical* to use Kukla's terminology, rather than social, though of course they can be, and often are, both. The import of Kukla's argument is that it is the social norm that people should have children that makes infertility a disease. Likewise, we would suggest it is the social norm that people should have children that tends to preclude our ability to recognise pregnancy as a disease. The two go hand in hand.

MEDICALISATION

Many of those who have written about pregnancy and childbirth, especially from a feminist perspective, are concerned about the ways in which these phenomena can be overmedicalised.⁴⁴ If the disease view of pregnancy results in patriarchal interference, coercion or intrusive surveillance, we should be

^{iv}We think Kukla is wrong about this with regard to cancer, there can be cases where cancer is a matter of degree as well. Nevertheless, the main point still stands here that the more hazy the diagnostic criteria, the less clear it is why we should classify something as a disease.

concerned. However, pregnancy is already routinely monitored and controlled; women are already under heavy pressure from society and from medical experts, to channel their gestational capacity in ways that are deemed suitable.

Pathologising pregnancy could, in fact, lead to better treatment for women. If pregnancy is construed as a disease and access to contraception and abortion as preventive medicine, it puts the provision of these interventions on a different footing. This is not about ‘family planning’ or reproductive autonomy, but about medical need. Among women who are pregnant, their preferences in terms of pain relief, mode of delivery, are frequently ignored precisely because the ‘normalness’ of these conditions mean that their detrimental effects on women are disregarded and the norms of medical ethics that govern doctor/patient interactions are often swept aside. To construe pregnancy and childbirth as a disease may offer an opportunity to reconfigure the relationship between the pregnant woman and the medical establishment.

CONCLUSION

We have argued that there are pragmatic grounds for classifying pregnancy as a disease on the basis that it shares important features with other diseases, such as measles. To be pregnant is to experience symptoms and face significant risks to life and health. We acknowledge that on accounts such as Boorse’s, pregnancy is not obviously a disease, but we note that such accounts seem to open further problematic questions about the relationship between pregnancy, evolution and species survival. We suggest that it is possible to find value in the experience of disease, and that therefore to classify of pregnancy as a disease does not preclude the possibility of its being valuable to those who experience it. Likewise, although we acknowledge the risks of medicalisation, we emphasise the point that pregnancy is already heavily medicalised, but in ways that simultaneously tend to deprive women of patient status, thus increasing their vulnerability in the medical system.

As things currently stand, caesarean section is one of the most common medical interventions⁴⁵ and one of the most common reason for hospitalisation in modern societies is childbirth.⁴⁶ Yet maternity services are often underfunded. Women report terrible experiences while giving birth, and at the same time, heavy pressure to become pregnant. We conclude that, as Kukla has shown in the context of infertility, the classification of something as either disease or not disease has profound normative implications. While classifying pregnancy as a disease comes with some risks, we suggest that a failure to recognise and respond to its disease-like features is likewise problematic, and puts many pregnant people at increased risk, as well as serving to reinforce and entrench social pressures on women in particular.

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REFERENCES

- 1 Tikkinen KAO, Leinonen JS, Guyatt GH, *et al*. What is a disease? Perspectives of the public, health professionals and legislators. *BMJ Open* 2012;2:e001632.
- 2 Demšar K, Svetina M, Verdenik I, *et al*. Tokophobia (fear of childbirth): prevalence and risk factors. *J Perinat Med* 2018;46:151–4.
- 3 Jethwa H, Lam S, Smith C, *et al*. Does rheumatoid arthritis really improve during pregnancy? A systematic review and Metaanalysis. *J Rheumatol* 2019;46:245–50.
- 4 NHS. Common health problems in pregnancy. 2018. Available: <https://www.nhs.uk/conditions/pregnancy-and-baby/common-pregnancy-problems/> [Accessed 31 Aug 2023].
- 5 European Centre for Disease Prevention and Control. Factsheet about measles. In: *European Centre for Disease Prevention and Control*. European Union, 2022. Available: <https://www.ecdc.europa.eu/en/measles/facts> [accessed 31 Aug 2023].
- 6 Tolu LB, Jeldu WG, Feyissa GT. Effectiveness of utilizing the WHO safe childbirth checklist on improving essential childbirth practices and maternal and perinatal outcome: A systematic review and meta-analysis. *PLoS One* 2020;15:e0234320.
- 7 World Health Organisation. Maternal mortality evidence brief. World Health Organisation Department of Reproductive Health and Research; 2019. Available: <https://apps.who.int/iris/bitstream/handle/10665/329886/WHO-RHR-19.20-eng.pdf?sequence=1> [Accessed 31 Aug 2023].
- 8 Paul A G, Susan B R, Nakia S C, *et al*. Chapter 7: measles. In: Sandra W R, Linda M B, eds. *Manual for the Surveillance of Vaccine-Preventable Diseases*. 2019. Available: <https://www.cdc.gov/vaccines/pubs/surv-manual/chpt07-measles.html>
- 9 Richie CS. Not sick: liberal, Trans, and Crip feminist Critiques of Medicalization. *J Bioeth Inq* 2019;16:375–87.
- 10 Young JM. Pregnant embodiment: subjectivity and alienation. In: *On Female Body Experience: 'Throwing Like a Girl' and Other Essays*. New York: Studies in Feminist Philosophy, 2005.
- 11 Cooper R. Disease. studies in history and philosophy of science part C. *Stud Hist Philos Biol Biomed Sci* 2002;33:263–82.
- 12 Loeffler S, Poehlmann K, Hornemann B. Finding meaning in Suffering?—Meaning making and psychological adjustment over the course of a breast cancer disease. *Eur J Cancer Care (Engl)* 2018;27:e12841.
- 13 Lechner SC, Zakowski SG, Antoni MH, *et al*. Do Sociodemographic and Disease-Related variables influence Benefit-Finding in cancer patients *Psychooncology* 2003;12:491–9.
- 14 Urcuyo KR, Boyers AE, Carver CS, *et al*. Finding benefit in breast cancer: relations with personality, coping, and concurrent well-being. *Psychology & Health* 2005;20:175–92.
- 15 Marino BS, Tomlinson RS, Drotar D, *et al*. Quality-of-life concerns differ among patients, parents, and medical providers in children and adolescents with congenital and acquired heart disease. *Pediatrics* 2009;123:e708–15.
- 16 Hambleton S, Arvin AM. Chickenpox party or Varicella vaccine? In: *Hot Topics in Infection and Immunity in Children II*. 2005: 11–24.
- 17 Li Wan Po A. Omicron variant as nature’s solution to the COVID-19 pandemic. *J Clin Pharm Ther* 2022;47:3–5.
- 18 Matthews J. Reluctant warriors: Republican popular army and nationalist army conscripts in the Spanish Civil War, 1936–1939. *Oxford Historical Monographs* July 12, 2012.
- 19 Smajdor A. The moral imperative for Ectogenesis. *Cambridge Q Healthcare Ethics* 2007;16.
- 20 Merskey H. Variable meanings for the definition of disease. *Journal of Medicine and Philosophy* 1986;11:215–32.
- 21 van der Pijl M, Verhoeven C, Hollander M, *et al*. The ethics of consent during labour and birth: Episiotomies. *J Med Ethics* 2023;49:611–7.
- 22 Lee JY. Consent and the problem of Epistemic injustice in obstetric care. *J Med Ethics* 2023;49:618–9.
- 23 Murphy H, Strong J. Just another ordinary bad birth? A narrative analysis of first time mothers’ traumatic birth experiences. *Health Care for Women International* 2018;39:619–43.
- 24 Aktaş S, Aydın R. The analysis of negative birth experiences of mothers: a qualitative study. *Journal of Reproductive and Infant Psychology* 2019;37:176–92.
- 25 Rothman BK. Pregnancy, birth and risk: an introduction. *Health, Risk & Society* 2014;16:1–6.
- 26 Baron T. Surrogacy and the fiction of medical necessity. *Camb Q Health Ethics* 2023;12:1–8.
- 27 Bynum B. Discarded diagnoses. *The Lancet* 2000;356:1615.
- 28 Wakefield JC. The Biostatistical theory versus the harmful dysfunction analysis, part 1: is Partdysfunction a sufficient condition for medical disorder *J Med Philos* 2014;39:648–82.

- 29 Cohon R, Edward NZ. The Stanford encyclopedia of philosophy (fall 2018 edition). In: *Hume's Moral Philosophy*. Available: <https://plato.stanford.edu/archives/fall2018/entries/hume-moral/>
- 30 Daniels N. *Just health care*. Cambridge, New York: Cambridge University Press, 1985.
- 31 Bage B. *Biological exuberance: animal homosexuality and natural diversity*. St Martin's Press, 1999: 196.
- 32 Elflein J. *Population of women aged 15-49 in the U.S. and worldwide in 2013 and 2025*. Statista, 2019. Available: <https://www.statista.com/statistics/654630/female-population-aged-15-49-us-worldwide/> [accessed 13 May 2022].
- 33 Bigna JJ, Tochie JN, Tounouga DN, et al. Global, regional, and country Seroprevalence of *Toxoplasma Gondii* in pregnant women: a systematic review, Modelling and meta-analysis. *Sci Rep* 2020.
- 34 Boorse C. Health as a theoretical concept. *Philos of Sci* 1977;44:542–73.
- 35 Boorse C. A second rebuttal on health. *J Med Philos* 2014;39:683–724.
- 36 Takahashi M, Singh RS, Stone J. A theory for the origin of human Menopause. *Front Genet* 2016;7:222.
- 37 Luoto S. Did Prosociality drive the evolution of Homosexuality? *Arch Sex Behav* 2020;49:2239–44.
- 38 Kingma E. What does it mean to be healthy? *Analysis* 2007;67:128–33.
- 39 Räsänen J, Smajdor A. The ethics of Ectogenesis. *Bioethics* 2020;34:328–30.
- 40 Segers S. The path toward Ectogenesis: looking beyond the technical challenges. *BMC Med Ethics* 2021;22:59.
- 41 Larson AC, De Bie FR, Chang J, et al. The Extrauterine environment for neonatal development: present and future. *Pediatr Dev Pathol* 2022;25:253–62.
- 42 Kokko H, Brooks R. *Annales Zoologici Fennici*. Finnish Zoological and Botanical Publishing Board, 2003: 207–19.
- 43 Kukla R. Infertility, Epistemic risk, and disease definitions. *Synthese* 2019;196:4409–28.
- 44 Romanis EC, Begović D, Brazier MR, et al. Reviewing the womb. *J Med Ethics* 2021;47:820–9.
- 45 Jauniaux E, Grobman W. Editorial caesarean section: introduction to the 'world's No.1' surgical procedure. In: Jauniaux E, Grobman W, eds. *Textbook of Caesarean Section*. Oxford, UK: Oxford University Press, 2016.
- 46 Canadian Institute for Health Information. Hospital stays in Canada. 2019. Available: <https://www.cihi.ca/en/hospital-stays-in-canada> [Accessed 13 May 2022].