# Gender, Status, and the Steepness of the Social Gradients in Health


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**Abstract:** Many social gradients in health appear steeper for men than for women. I refer to this as the "Steepness Puzzle." This paper explores the ethical implications of this Puzzle. First, it identifies potential explanations for the Steepness Puzzle, including methodological problems. Second, it highlights two harms associated with the methodological explanation: the consequences of biased epistemic practices and the marginalization of women. It also demonstrates how attempts to flatten the gradients in health could disproportionately favor men or reinforce troubling gendered norms. Finally, I suggest ways to address the methodological problems underlying the Puzzle.

**Keywords:** gender bias, population health ethics, public health ethics, social determinants of health, socioeconomic status

## 1. Introduction

The higher one's social status, usually, the better one's health. A consistent association exists between increments of health and increments of social status, and it continues to exist across a variety of measures of both health and of social status. This association applies strongly to both men and women across numerous countries, developed and developing, and is commonly referred to as "the social gradient(s) in health" (WHO 2008a, 31).

A puzzling corollary is that many social gradients in health appear to be steeper on average for men than they are for women. Put another way, results indicate that there is frequently greater inequality in health among men than among women. This is puzzling partially because, all other things being equal, women are relatively more likely than men to be exposed to negative social determinants of health through discrimination and disadvantage (WHO 2008b). While it is not obvious how women's disadvantage should translate into the steepness of the gradient, it is also not self-evident why there should be greater equality in health among higher and lower-status women than among higher

and lower-status men. I will refer to this as the "Steepness Puzzle." While it is not a new phenomenon in the public health literature—its causes have led to speculation for a few decades now among a handful of researchers—it has not received much attention.[1] Furthermore, it seems, thus far, to be neglected in the bioethics literature.

My aim in this paper is to consider the ethical implications of the Steepness Puzzle, which in turn will help provide guidance to researchers and policy-makers concerned with the social gradients in health. In section two of the paper, I describe the Steepness Puzzle and identify potential explanations for it. I show that the little existing research on the topic indicates that at least part of the explanation has to do with the methodology of studies. In the third and fourth sections, I consider the ethical implications of the Steepness Puzzle. In section three, I will highlight two harms associated with the methodological explanation for the Puzzle: the harmful consequences of biased epistemic practice and the marginalization of women. The third ethical implication, identified in section four, is related to potential unintended consequences of ameliorating the social gradients in health. In light of the Steepness Puzzle, I argue, some attempts to flatten the gradients in health could unknowingly disproportionately favor men while disadvantaging women, and some attempts to flatten the inequalities in social status behind the social gradients in health will leave intact or reinforce gender biases. In the final section, I highlight actions that can be taken to address some of the causes underlying the Puzzle.

## 2. The Steepness Puzzle

Social gradients in health are health inequalities that are correlated with inequalities in social factors, such as income, level of education, access to health care, neighborhood deprivation, occupational class, and working conditions (Phillips and Hamberg 2015; WHO 2008a; Marmot 2005). These inequalities are often referred to in the epidemiological literature more specifically as inequalities in socioeconomic status. In turn, they are also referred to, or linked to, "the social determinants of health"—the social conditions in which people live and work which impact health (WHO 2008a).

Social gradients in health often follow the pattern "wealth means health." In other words, the higher the individual's social status (e.g., income or level of education or both) the better their health.[2] This is not merely an inequality between those with sufficient access to important resources and those who are materially deprived. It is a *gradient* because it is incremental; for each step up the social ladder (e.g., from high school dropout to high school graduate to having some college education and so on), health improves. Studies show that social gradients in health occur with a wide range of measures, and combinations of measures, of social status and also occur worldwide in countries across a range of GDP and levels of development (WHO 2008a).

Social gradients can be more or less steep depending on the range of the measures of health or ill-health from smallest to largest. The bigger the difference

between the smallest and the largest features, the steeper the gradient and the greater the inequality between the worst off and the best off. The smaller the difference, the narrower the gradient and thus the smaller the inequality between the worst off and the best off. Take self-reported depressive symptoms as the measure of health for example. If the lowest intensity of symptoms is reported at one and the highest at nine, then this is a steeper gradient than if the lowest were two and the highest were seven.

Women and men experience social gradients in health. In a number of studies social gradients in women's health have been seen to be less steep in comparison to the same gradient in men's health. In other words, even when the measures of social status and the measures of health are consistent, there is often greater health equality between women than between men (McDonough et al. 1999; Mustard and Etches 2003; Phillips and Hamberg 2015). This is the Steepness Puzzle. This Puzzle occurs across a range of measures of health, such as mortality and self-reported health (SRH), as well as a range of measures of social status, such as education and income (Phillips and Hamberg 2015). These results are not confined to a particular country or region—greater equality in social gradients of health among women relative to men is consistent among a range of countries.[3] A notable exception to the Steepness Puzzle is the mortality rate for cardiovascular disease, where the gradient is often steeper for women than it is for men (Phillips and Hamberg 2015).

What explains this gendered difference in social gradients in health? That there are gendered patterns of social gradients of health should come as little surprise when we consider the significant social roles that gender plays. Prima facie, gendered patterns of health do not seem surprising. It is not obvious, however, what explains the Steepness Puzzle (which is why I refer to it as a *puzzle*). It is not clear why women, who tend to suffer a range of unfair social disadvantages, should be relatively less affected by social gradients in health than men, if, indeed, the Steepness Puzzle means that they are.

Preliminarily, there are two potential explanations for the Steepness Puzzle: the relative immunity hypothesis and the relative susceptibility hypothesis. According to the relative immunity hypothesis, something about being a woman makes one relatively immune to social gradients in health.[4] According to the relative susceptibility hypothesis, something about being a man makes one relatively susceptible to social gradients in health. Considering that women outlive men globally, we may suspect that the steepness of the social gradients in health follows some kind of pattern similar to life expectancy. As with life expectancy, then, being a woman or a man will, in and of itself, protect or make one more susceptible to social determinants of health respectively. Note, however, that mortality or life expectancy are not the only health outcomes that follow a social gradient in health, so if these hypotheses apply to the Steepness Puzzle generally, they extend beyond these measures of health.

While these two explanations include biological reasons for the Steepness Puzzle, they need not be about biology. For example, we could surmise that due

to the social construction of gender roles and norms, men are put under greater pressure to achieve higher social status than women. This, in turn, increases the likelihood of greater psychosocial stress for men of lower status, and, thus, also leads to an increased likelihood of experiencing negative health outcomes due to this stress.

Even a rudimentary awareness of feminist epistemology and philosophy of science (e.g., Anderson 1995; Lloyd 2006; Potter 2006) should make us consider a third potential explanation for the Steepness Puzzle: research showing a difference in the steepness of gradients between men and women may be influenced by gender biases. Like other scientific studies, the way in which epidemiological studies are designed and conducted may (implicitly) incorporate gender values and norms, which could then influence their results. For example, they may be androcentric, thus assuming that the socially constructed roles and norms that influence what it means to be a man are the norm, ignoring potential differences between genders, which in turn could skew the results of research (Ruiz-Cantero et al. 2007). A hypothesis to explain the Steepness Puzzle that takes gender biases in science seriously assumes that the difference in the end results—the steepness of gradients—could be influenced by gender values in the knowledge production process.

There is, thus, at least one further hypothesis that needs to be introduced as a potential explanation of the Puzzle: the methodology hypothesis. According to this hypothesis, problems in study design and the methodology of the empirical research (e.g., the neglect of socially constructed gender differentiations in social status) actually distort the results of research creating the impression that women are relatively immune to the social factors that influence health, whereas indeed they may not be or may not be to such an extent. The truth of the methodology hypothesis implies that women's social gradients in health may be steeper than many studies tend to show, and *perhaps* if the methodological biases were resolved, there would be no consistent difference in the steepness of the social gradients in health between men and women. Even if the hypothesis were true, however, it is possible that there could still be a difference, even a large one, in the steepness of social gradients between men and women. We would then need to conduct research in a way that minimizes these biases in order to uncover the reality underlying the Steepness Puzzle.

What does the (limited) empirical research and analysis of the Steepness Puzzle tell us about these three hypotheses? While much more research is required, it seems apparent that the two initial hypotheses—relative immunity and relative susceptibility hypotheses—are insufficient to explain the Puzzle and that there is evidence for the methodology hypothesis. Gender biases in how social status and health are understood and measured, as well as certain gender specific interactions of the social determinants of health, are among the explanations for the difference in the steepness of gradients between men and women. There are several reasons suggested for why social gradients seem to be

less steep for women, which do not seem to fit the relative immunity or susceptibility hypotheses:

1. Gender differentiations in the social determinants of health are not adequately taken into account. Social determinants of health that are more likely to affect men often seem to be primarily researched, and social determinants of health that are more likely to affect women are often not researched. First, studies have often focused on aspects of social status that may have a greater effect on men's health than on women's health or on markers of social status that are more likely to be experienced by men. For example, many studies have focused on the influence of workplace conditions and occupational hierarchies, and there is some evidence that this has a greater impact on men's health than on women's health (Phillips and Hamberg 2015). It is not necessarily clear why this would be the case, but there may be a variety of reasons. One way to consider this would be from a model of psychosocial stress[5]: perhaps in more gender-traditional societies where there may be more pressure put on men than on women to achieve high status in the *workplace* particularly (and greater pressure on women's success in the domestic sphere), there may be relatively greater stress associated with lower status for men in the workplace. Another or supplementary possibility: women who lack freedom over domestic decisions or are overwhelmed by household tasks may feel more empowered in the workplace, relative to men.[6] It is also possible that there are not often enough women in high status positions to be able give us as much data as we have about men.

   Second, it is likely that few studies have identified social determinants of health that are more likely to affect women. Some studies indicate that women's health is affected greatly by factors associated with their households (e.g., "household material deprivation and domestic workload"), whereas men's health is negatively impacted relatively more by factors associated with the workplace (Phillips and Hamberg 2015). However, factors associated with the household can receive less attention than factors associated with the workplace. For example, when studying occupation, a number of studies have simply omitted the category of "housewife" or something similar (Phillips and Hamberg 2015).
2. Gender-sensitive interactions between social determinants of health are not adequately being taken into account. While single risk factors are themselves subject to gender differentiation, the social determinants of health interact, and these interactions are also gender sensitive. Considering social factors such as education or income in isolation gives us very little information in comparison to considering the interaction of multiple factors. How social factors interact can differ between men and women. For example, Phillips and Hamberg (2015) highlight that "among British civil servants the modifying effect of characteristics such as social support, primary deprivation, and pessimism on the relationship of job insecurity to poorer health was

markedly different for women and men"; these factors in combination explained around two-thirds of the association between job insecurity and poor health for women, but only around one third for men (Ferrie et al. 2005). Furthermore, gender-specific interactions may directly influence the steepness of the social gradients for women. An example is level of education and the likelihood of being married, each of which is associated with greater health for men and women. However, while high status men tend to have high levels of education *and* tend to be married, high status women tend to have high levels of education but are less likely to be married than high status men, and so these women do not receive the double protection of two social determinants of health (i.e., high education and marriage). Thus, it is possible that the interaction between these two social determinants of health equalizes the relative health of lower and higher status women (Koskinen and Martelin 1994; Phillips and Hamberg 2015).

3. Measures of health may not adequately take factors that affect women's health into account. As we have seen, differences in how social status is gendered might not be incorporated sufficiently into research on the social determinants of health, but this is also true in terms of the differences in how *health* may be gendered. Research shows, for example, that when it comes to self-reported health, studies that include mental health indicators (e.g., pessimism and vigilance) highlight a steeper social gradient in women's health than studies that do not include those indicators (Phillips and Hamberg 2015). In fact, when mental health indicators are included, one study showed that the social gradient in women's health may be steeper than that of men's (Hamberg and Phillips refer here to the study by Ferrie et al. 2005). Steepness, then, is influenced by how health is measured, and this implies that we cannot take the gendered difference in the steepness of social gradients in health for granted.

While the reasons discussed thus far show us that the relative immunity and susceptibility hypotheses cannot be the only factors influencing steepness, another prominent reason put forward as one of the explanations for the Steepness Puzzle does seem to give some weight to these hypotheses:

4. Gender differentiations in the cause of death may narrow gradients of women's health. Men are more likely than women to die of causes that have a steeper social gradient (Koskinen and Martelin 1994; Mustard and Etches 2003). For example, men are more likely than women to die of accidents and violence, and these causes of death have a very steep social gradient. On the other hand, breast cancer is a major killer of women and yet breast cancer is associated, as mentioned earlier,[7] with an inverse social gradient; higher status women are more likely to develop breast cancer than lower status women, potentially contributing to a narrower social gradient for the cancer morbidity rates for women.

These four factors, especially in combination, are likely to explain the Steepness Puzzle, at least partially. They imply that the relative immunity and susceptibility hypotheses are insufficient explanations for the Puzzle and that the methodology hypothesis is relevant. These hypotheses are not mutually exclusive, and they could each contribute to explaining the Steepness Puzzle. Given the hypotheses, and particularly the fact that there is plenty of evidence for the methodology hypothesis, what should we be concerned about from an ethical perspective?

## 3. Two ethical implications of the Steepness Puzzle

This section identifies two ethical implications associated with the Steepness Puzzle and especially with ignoring its methodological explanation: the harmful consequences of biased epistemic practice and the marginalization of women. These two *harms* necessarily follow from the Steepness Puzzle, given the methodology hypothesis, or at least are highly likely to follow from it. The harmful consequences of biased epistemic practices and gender marginalization are only relevant if the methodological hypothesis is correct, and as much as it seems clear from the evidence presented that this hypothesis is indeed correct (although it might not be sufficient), we can be sure that these harms are implied.

### *a. The consequences of biased epistemic practice*

Given the methodology hypothesis, an obvious concern implied by the Steepness Puzzle is epistemic; we are acquiring mistaken or incomplete knowledge. The methodological problems leading to the Steepness Puzzle have a negative impact on knowledge production. If we are not designing studies to include women's particular experiences of social status and of health, then we will not have results that reflect those experiences. In turn, this can have consequences for morally significant social goals, such as improving overall population health, as we may not be able to achieve these goals with the limited or distorted knowledge that we have. Additionally, we need to consider the harm in relation to the particular gender dynamics at play. While overall population health and social welfare could be negatively impacted because we may not be measuring health and social status correctly, it is important to consider that a particular social group—women—might be negatively influenced. This is because we may not have the correct knowledge to improve their health or social status, or both, as how their health is being affected by social status is not being properly measured, understood, and interpreted, as the methodology hypothesis implies.

### *b. The (continued) marginalization of women*

When women's health and the forms of social status that apply particularly to them are neglected, and the particular experiences of men are treated as the norm as implied by the methodology hypothesis, women's experiences are marginalized. The marginalization of women seems to be both a cause and a

consequence of the Steepness Puzzle. It is a cause as it is likely *because* women's experiences are often marginal and men's are central that the methodology hypothesis is true. It is also a consequence of women's marginalization as women's particular experiences of health and of social status continue to be neglected as a result of not being identified and investigated. The fact that this is both a cause and a consequence is particularly worrying—it seems that the very thing that is causing the problem is being reinforced by its consequences. Women's marginalization is, of course, not limited to research about health, or to research at all—it is part of a broad systematic social, political, and economic pattern of marginalization and exclusion which is partially constitutive of gender oppression (for an influential account of the constitutive components of oppression, including marginalization, see Young 1990). The particular form of marginalization captured here can be seen to be a manifestation of this broader pattern as well as being constitutive of its continuation.

## 4. Potential ethical problems with addressing the gradient

In addition to the ethical implications described in the previous section, there are also potential ethical problems that are likely to occur if certain actions are taken to address social gradients in health, that is, in certain instances in which health policy-makers would aim to flatten social gradients in health without taking the Steepness Puzzle into account in the process. In this section, I will describe and unpack this third ethical implication of the Steepness Puzzle—the potential problems associated with flattening social gradients in health—in detail, more detail than I provided for the first two implications. This is not an indication of its moral significance in relation to the other two implications, in other words, this is not because it is ethically more important; rather, it is an indication that this is a trickier implication to identify than the other two (it is not as intuitive) and it requires relatively greater clarification. While the first two implications are primarily only relevant if the methodology hypothesis is correct, for this third implication, we should be concerned about it no matter which hypothesis is correct, although it becomes even more of a concern once we recognize the methodology hypothesis.

Addressing social gradients in health could include attempting to "flatten them out," in other words, to make them more equal, bringing those who are worst off closer in health to those who are better off, or even vice versa. Who would advocate that social gradients in health should be flattened? Epidemiologists, political philosophers, and policy-makers need not subscribe to a particular theory of health justice in order to advocate for flattening the gradient; however, it is particularly those who care about *group-based disparities* in health (e.g., health inequalities between different social classes) who are likely to advocate this flattening out.[8] For those convinced about the importance of reducing group-based heath inequalities, what ethical reasons could be given as to why social gradients in health should be flattened? Another way of putting this, one that is typical of the public health literature, is that we are

asking the question, "When are gradients in health inequitable?" All inequalities cannot be inequitable. Indeed, some inequalities may be ethically required (e.g., the disproportionate treatment of those who are disadvantaged in order to improve their advantage). However, some inequalities are inequitable, and in this section we are exploring claims as to which inequalities are inequitable and why.

There are various ways in which one can describe the positions available. For the purposes of this paper, very broadly, I distinguish two kinds of group-based egalitarianism: health-outcome egalitarianism (or outcome egalitarianism, for short) and health-determinant egalitarianism (or determinant egalitarianism, for short).[9]

*Outcome egalitarians* consider group-based health inequalities per se to be ethically impermissible or inequitable. They may also find the causes or effects of health inequalities ethically problematic, but the specific view they endorse maintains that whatever we may think of the causes or effects, the health inequalities themselves are problematic. This need only be seen as a pro tanto claim: it is possible that if we take other values into account (some) health inequalities will be permissible all things considered.

*Determinant egalitarians* consider the permissibility of health inequalities on the basis of whether the *causes* of the health inequalities are ethically problematic. *Health* inequalities themselves are not per se problematic but rather their causes may be. So, for example, if health inequalities are caused by racial discrimination or by unequal access to health care resources, that is what makes them problematic. The health inequalities are making a bad situation worse, but even if no health inequalities or any detriment to health followed, the distribution of social status or social goods would in any case be unfair.

Pro tanto, both of these positions will advocate flattening the social gradients in health in some form. Health outcome egalitarianism will advocate flattening out the actual health inequalities, while determinant egalitarianism will advocate flattening out the inequalities in social status that are influencing health, or at least some of them. If we care about inequalities, it may seem intuitive that we should be flattening out gradients in health. While I agree that this is likely to be an important aim, however, considering gendered differences in status and health, we should note two possible cautions: unknowingly disproportionately favoring men and reinforcing gender norms.

### *a. Unknowingly disproportionately favoring men*

The first caution has to do with disproportionately favoring men. If we ignore the Steepness Puzzle, we may be unknowingly favoring men. Under certain circumstances, favoring men may be justified as the correct ethical action, but we need to know that we are indeed favoring men (and to be clear that this is what we aim to do). In other circumstances, we may be favoring men and this may not be the correct ethical action. Let me illustrate with the following scenarios:

Imagine that the health of a particular population follows a gradient of social status represented by table 1, with the lowest status on average having the lowest level of health, the highest status having the highest level of health, and for each step up the social ladder in between these extremes there is a gradual increase in health. This example is purely for illustration and for that reason it is intentionally general. I will specify neither the measure of social status nor health yet. Additionally, for the purposes of this discussion, take it that the number of individuals in each category is the same (e.g., 1 or 100).

Now, let us say that it is possible to implement "Social Policy A," which managed to improve the health on average of those on the lowest social rungs to 5.5 and which would also, as part of the process, decrease those of the highest status, represented by table 2.

On the basis of the information we have at hand, and without considering the Steepness Puzzle, one could argue that we should implement Policy A. If we are looking for a principled explanation for why we should do so, we could refer to outcome egalitarianism; it would provide us with an ethical reason to advocate this policy, as it creates greater equality (this is assuming that outcome egalitarians favor *greater* equality over inequality, even if their primary aim is to create equality).[10]

Let us consider this scenario in light of the Steepness Puzzle, however. There are at least two ways in which knowledge of the Steepness Puzzle may influence how we should think of this situation from an ethical perspective. First, let's say

Table 1. Before Policy A: Social gradient in health—Aggregate data

| **Social Status** | **Health—Aggregate** |
|---|---|
| Highest | 8.5 |
| High | 8 |
| Middle | 7 |
| Low | 6 |
| Lowest | 5 |

Table 2. After Policy A: Social gradient in health—Aggregate data

| **Social Status** | **Health—Aggregate** |
|---|---|
| Highest | 8 |
| High | 8 |
| Middle | 7 |
| Low | 6 |
| Lowest | 5.5 |

that being attuned to the possibility of the significance of gender differences, we consider this social gradient in health according to gender-differentiated data. Differentiating the data may show us that we are not influencing the health of the population so much as improving the health of men at the cost of women (represented by tables 3 and 4). Let's specify, in this case, that the measure of health is related to life expectancy. We can expect that the worst-off will mainly be men, and the best-off will be women, so this means that we are not merely improving the health of those of lowest status when we improve the health of those who are worst-off, we are improving mainly men's health. This does not necessarily mean that making this improvement is wrong. Indeed, we might claim this is ethically precisely what we should be doing. If we are outcome egalitarians, we would still be doing what we believed to be the right thing; that is, decreasing inequality.

However, it seems to me that we must be clear about what it is that we are doing in order to be able to take the relevant ethical factors into account and to justify our actions. We must be able to say explicitly, we are predominantly improving men's health and we are doing so at the expense of women's health, and that this is morally permissible or required in order to promote greater outcome equality.[11] In this kind of case, if we made this improvement, without taking the

Table 3. Before Policy A: Social gradient in health—Gender-differentiated data

| **Social Status** | **Health—Aggregate** | **Health—Differentiated** | |
|---|---|---|---|
| | | **Men** | **Women** |
| Highest | 8.5 | 8 | 9 |
| High | 8 | 7.5 | 8.5 |
| Middle | 7 | 6 | 8 |
| Low | 6 | 4.5 | 7.5 |
| Lowest | 5 | 3 | 7 |

Table 4. After Policy A: Social gradient in health—Gender-differentiated data

| **Social Status** | **Health—Aggregate** | **Health—Differentiated** | |
|---|---|---|---|
| | | **Men** | **Women** |
| Highest | 8 | 8 | 8 |
| High | 8 | 7.5 | 8.5 |
| Middle | 7 | 6 | 8 |
| Low | 6 | 4.5 | 7.5 |
| Lowest | 5.5 | 4 | 7 |

Steepness Puzzle and its gender differentiations into account,[12] then we might erroneously believe that implementing Policy A would help the population overall, and we would not need to justify why we are helping this particular sub-population men of low status and low health at the expense of women.

Second, now consider specifically the methodological explanation for the Steepness Puzzle. If the measures of health or social status we are using do not accurately reflect the gradients in health for women, we may not even *be doing the good that we think we are doing*. For example, who seems to be worst off health-wise may be influenced by the fact that certain measures of health that are particularly relevant to women are not being measured. Take table 4 again, except this time the measure of health is morbidity measured in a way that excludes features that seem relevant to women's health, such as depressive symptoms. Also, status has been measured in a way that does not include factors that in this particular community influence women's status, such as domestic workload. This will mean that the information we are using to populate this table are likely to be incorrect. The gradient for women's health may look very different both in terms of the steepness of the gradient and in terms of the absolute values. We do not know what implementing Policy A is doing for women's health, and indeed as women's health in this case may be as bad or worse than men's, we may not be taking the correct ethical action, using the justifications we would have used for Policy A in the previous example.

In terms of the two kinds of egalitarians I identified at the outset, it seems that this problem is particularly a concern for group-based *outcome* egalitarians because they advocate reducing health inequalities per se. If one wanted to continue advocating outcome equality, it would be important to recognize these potential concerns about gender differences and try to understand how this would influence our ethical assessment of a particular policy before advocating that policy.

### *b. Reinforcing gender norms*

We may however believe for various reasons that outcome egalitarianism is flawed and we should not subscribe to it, notwithstanding the Steepness Puzzle. Determinant egalitarianism would not recommend a flattening of the health gradient per se, and we may think that the Steepness Puzzle has less relevance for this form of egalitarianism. However, there is also a significant caution here.

Determinant egalitarians may not think that the health inequalities themselves are problematic, but they are likely to claim that we should provide those who are worst off in terms of social status with more of the "social status" that they lack, or opportunities for that status, in order to achieve greater determinant egalitarianism. Now, this is understandable and correct much of the time. We should provide people with better educations, better access to quality health care, better opportunities, increased decision-making power in the workplace. We should also eliminate racial discrimination, counteract implicit racial bias, and so on. However, the Steepness Puzzle indicates that it is not correct to say

that what we should be doing straightforwardly is providing people with the means that will promote a better distribution of the social determinants of health. The Steepness Puzzle reminds us that social status is not gender neutral and that simply providing men and women with more of the social determinants of health, or opportunities for those determinants, may reinforce problematic gender norms. For example, if we find that for a woman being married or having children helps to determine health, whether for better or worse, we would not necessarily aim as part of our public policies to provide them with greater or with fewer opportunities for marriage or for having children as a solution to either health or status inequalities. At least theoretically, even determinant egalitarianism may well have the problematic implication that a solution to social gradients in health could be creating greater opportunities for highly gendered opportunities which reinforce gender norms (e.g., how important it is for a woman to be married) unless we take the Steepness Puzzle and its normative implications into account.

Social gradients in health merit urgent social attention, but we must be careful not to neglect certain relevant ethical factors if we try to flatten health inequalities or flatten the underlying inequalities determining health without taking the Steepness Puzzle and its causes into account.

## 5. Addressing the causes of the Steepness Puzzle

Our examination of some of the probable causes of the Steepness Puzzle and the ethical analysis show us that we have good ethical reason to address the causes of the Steepness Puzzle, so that we can avoid the implied harms. In this final section of the paper, I highlight actions that are likely required to mitigate problems associated with the Steepness Puzzle.

As with any concerns associated with oppression and discrimination, addressing the problem actually requires wide-ranging, structural reform. Consider that one of the reasons why the particular experiences of women's social status and health are likely to have been neglected is part of the wider social injustice of the marginalization of women's experiences.[13] While major structural reform is part of the solution, individual researchers or policy-makers can make smaller changes in how they conduct research or conceptualize social gradients in health in a way that can make practical differences.

One of the primary solutions, setting aside the importance of major structural reform, is that research that will help us to better understand the Steepness Puzzle needs to be prioritized, and research on the social gradients in health needs to be conducted in such a way so as to mitigate the methodological causes of the Puzzle. For a start, if studies present only aggregate data, and not data that has been differentiated by gender, then we cannot make progress in understanding the gendered differences in social status, health and the steepness of the gradients. In their review, Phillips and Hamberg (2015) recommend that "all SES gradient research" should be stratified by gender, meaning we should include data differentiated for men and for women. I would add to this that such studies

should use data differentiated in order to ensure adequate representation and the identification of transgender, queer, or nonbinary individuals. For example, a two-question method for establishing gender can be used which differentiates between current gender identity and gender assigned at birth (Tate et al. 2013). One of the pitfalls of tackling the causes underlying the Steepness Puzzle is that we could reinforce binary notions of gender and sex which continue to exclude LGBTQIA+ individuals by emphasizing the differences between men and women, reinforcing the notions that there are only two genders, or reinforcing a straightforward relationship between biology and gender.

Further recommendations for empirical studies include the following: mental health indicators should be considered when measuring health; the different ways in which social factors might influence women's health need to be considered in study design and the choice of status and health measures; and, preferably, multiple social factors should be studied so that the interaction between factors, such as education and marriage, can be better understood. Additionally, we should be particularly worried about the potential contribution of intersectionalities[14]: the women and men who are worst off in terms of social status and health are also likely to suffer from additional social injustices (e.g., they are blue-collar workers, people of color, or people with disabilities). In order to best understand the impact of social factors on health, and how this feeds into the Steepness Puzzle, we will also need to measure indicators that can reflect characteristics associated with further disadvantage and unfair treatment.

Lastly, I would advocate that researchers and policy-makers involved with social gradients in health need to assess how "socioeconomic status" is conceptualized in describing social gradients in health and qualify its continued use. The kinds of social gradients in health regularly referred to in the public health literature are often associated with *socioeconomic status*. Here are examples taken from the titles of papers that deal directly with the Steepness Puzzle: "the Socioeconomic Gradient in Mortality" (McDonough et al. 1999), "socioeconomic inequality in mortality" (Mustard and Etches 2003), and "the socio-economic health gradient" (Phillips and Hamberg 2015). In the public health literature, the term "socioeconomic status" is often used to mean "social status" or "social standing," but it is also a specific measure of social status, especially one that can be reduced to income or to a combination of occupational, economic, and educational criteria (McDonough et al. 1999; Mustard and Etches 2003; Porta 2014; Phillips and Hamberg 2015). The Steepness Puzzle demonstrates a problem here: not enough of a distinction is being made between, on the one hand, *specific indicators of social status*, which are contingent and will differ according to a number of factors including gender, and, on the other hand, *social status itself*. Take income as an example: it is a potential indicator of status but should not be seen as a definite marker of status or as equivalent to a person's position or social standing. In some societies or for certain population groups, income or other potential indicators of status, might not be a primary means of conferring status. If we then measure the relationship between these indicators and health,

we are not necessarily measuring how social status affects health but rather how this specific marker does.

This is something we learn from the Steepness Puzzle because when we think about status and its manifestations in this way, we can see more clearly that research, at times, measures merely markers of status which do not confer social status on both genders equally. In these cases, the explanation for why the gradient may be steeper for men is that what is being measured is not as much of a marker of status for women as it is for men. Particularly in societies with more conservative or traditional gender roles, factors associated with occupation, such as control in the workplace, may not impact on health as much for women as they do for men. On the other hand, factors associated with family life, such as domestic workload, may be more dominant markers of status or more dominant determinants of health for women. If a study shows that a particular marker does not influence women's health as much as men's, this does not mean that women's social status is not influencing their health, which we might erroneously conclude by looking at the difference in the steepness of gendered gradients, but, rather, we may not yet have determined the particular indicators of women's social status.

In order to rectify this, when we talk about the relationship between status and health, we need to be clear whether we are considering a specific indicator of social status or actual social status manifest in what may be a variety of markers. There are at least two options here. First, we could avoid using the term "socioeconomic status" at all and rather refer only to the very specific markers of status. If we use the term socioeconomic status to refer to social gradients in health and claim that there is a steeper gradient in health for men than for women, this could be misleading because it might not be that something as general as the gradients in socioeconomic status or social status and health are steeper for men in a particular community but rather that we are focused on only one or two markers of status, and men's health is only steeper for these markers. Second, if we do want to use the term "socioeconomic status" (or socioeconomic inequalities or gradient), we would at least need to define how we are using it and to specify if we are using it in a non-typical way (e.g., to include potential markers of women's social status, such as domestic workload not typically included under many definitions of socioeconomic status).

Furthermore, emphasizing the contingent nature of social status helps us to avoid further reinforcing problematic gender roles. An emphasis on the idea that women's health is influenced by domestic circumstances in conjunction with workplace conditions could reinforce gender norms by seeming to naturalize gender roles. When we recognize that the indicators of social status we are measuring are contingent, and that income or place in an occupational hierarchy are only markers of social status when they are assigned as such within particular societies for particular groups, we avoid indicating that the gender differentiations associated with social status are inevitable. It may be *because* men's roles in the workplace and women's roles in the home are valued within

a particular community that these have gender-differentiated influences on health; in another community, which does not have such strong gendered roles, health might not be affected in this way.

## 6. Conclusion

In this paper, I have described the Steepness Puzzle and identified potential explanations for it, highlighting the evidence for how the methodology of studies may be contributing to what seems to be a narrower social gradient in health for women. Using this as a basis, I have highlighted the ethical implications associated with the Puzzle: the harmful consequences of biased epistemic practice, the marginalization of women, and the potential problems with addressing social gradients in health such as disproportionately favoring men and reinforcing gender norms. To try to mitigate the problems associated with the Steepness Puzzle, I have provided guidance for researchers and policy-makers in approaching the social gradients of health. An ethical assessment of the harms associated with the Steepness Puzzle is a step in the direction of determining how best to understand and research social gradients in health in a way that will help us to develop equitable health policy.

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## NOTES

1. Phillips and Hamberg's (2015) recent study is the only attempt of which I know to review a range of studies from a number of countries in order to try to identify the causes of the Steepness Puzzle. They used thirty-six papers, primarily but not exclusively from Europe and North America, to draw their conclusions. However, the Steepness Puzzle has been identified and investigated since at least the 1990s. For examples, consider Koskinen and Martelin (1994) and McDonough et al. (1999).
2. This is true for the majority of health outcomes, however, a notable exception is the incidence of breast cancer. Women of higher status are more likely to develop breast cancer than those of lower status (e.g., Robert et al. 2004; Lundqvist et al. 2016). It is significant to note, however, that women from minority groups in the United States, such as women of color, tend to experience "worse breast cancer outcomes" despite having a lower incidence of breast cancer (Reeder-Hayes et al. 2015),

and black women in the United States are more likely to die of breast cancer than white women (Whitman et al. 2011). A variety of social factors thus influence the incidence, treatment, and mortality rates associated with breast cancer with some following an inverse gradient (i.e., the better off are less healthy) and some following the typical gradient (i.e., the disadvantaged are less healthy).

3. Most of the studies on which this paper relies were conducted in high-income countries, although this included a range of those countries, such as the United States, the United Kingdom, Hungary, and Sweden. The relatively fewer studies in middle-income countries, such as Thailand, do show similar results, however. The consistency of the Steepness Puzzle across a wide variety of countries cannot then be reduced to country-specific factors even where those contribute to vast health inequalities *within* that country (e.g. the mass incarceration of African-American men in the United States). For information on mass incarceration, see Alexander (2012); Wildeman and Wang (2017).
4. A range of individuals can be women because they self-identify as women without having any sex-specific biological features in common. This is significant for a number of reasons. One, eliding the difference between being a woman or a man or another gender and being an individual with a specific biology means that transgender, nonbinary, and queer individuals often become excluded from the gender with which they identify. Second, for research on health, it is important to isolate which features impact which aspects of health. For example, we can ask whether biology or social factors, or both, explain the Steepness Puzzle.
5. Michael Marmot (2004) and Richard Wilkinson and Kate Pickett (2009) have indicated that the stress of being at the bottom of social hierarchies might be part of the explanation for social gradients in health.
6. I thank Susan Phillips for raising this possibility.
7. See note 2 above.
8. Consider Nir Eyal's (2015) explanation of group-based egalitarianism (or what he refers to as status-group egalitarianism) Eyal identifies Paula Braveman (2006) and Norman Daniels (2008) as examples of group-based egalitarians. These kinds of egalitarians can be contrasted to individualist egalitarians; the latter are only concerned about equality between *individuals* rather than between groups. If one only cares about the moral significance of inequalities between individuals, then social gradients in health are per se unlikely to be of concern; health inequalities between individuals should be flattened (or the health of the worst-off should be improved). For individualist egalitarians, then, the concerns I highlight in this section of the paper are unlikely to be relevant. I thank Kristin Voigt for pressing me on this point.
9. The discussion here of egalitarianism and its relationship to health is a simplification of the debates within political philosophy and population-level bioethics about the injustice of inequality. For more on the different understandings of which kinds of equality are morally significant, see Parfit (1997); Anderson (1999); Fourie (2012); Moss (2014). For more on the significance of inequalities related specifically to health see, Marchand et al. (1998); Powers and Faden (2006); Daniels (2008); Eyal et al. (2013).
10. This form of egalitarianism is not our only option though—by implementing Policy A, we would be improving the health of the worst off (a prioritarian reason) (Fourie 2017, 11–16). Also, note, this is not a case of "leveling down" as it is understood in the philosophical literature. Concerns about leveling down are related to cases

where we make the better-off worse-off, thereby decreasing inequality, but to no advantage to any other groups including the worst-off (Parfit 1997).

11. If it is indeed ethically justifiable. Note, I am not endorsing any of these claims (nor denying them); rather, I am indicating what we would need to do in order to justify them.
12. Admittedly, even without knowledge of the Steepness Puzzle specifically, we may have a good idea that we are likely to be favoring men at the expense of women, if we simply know that women tend to live longer than men. However, the Steepness Puzzle reminds us that even if we are not looking at life expectancy generally but in terms of status inequalities in health, and that includes health and illhealth measured according to morbidity, we should be concerned about gender differences.
13. For a discussion of structural injustice, see, for example, Young (1990).
14. For an influential explanation of the significance of the intersectionality of gender and race, see Crenshaw (1989).

## REFERENCES

Alexander, Michelle. 2012. *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. New York: The New Press.

Anderson, Elizabeth. 1995. "Feminist Epistemology: An Interpretation and a Defense." *Hypatia* 10 (3): 50–84. https://doi.org/10.1111/j.1527-2001.1995.tb00737.x

———. 1999. "What Is the Point of Equality?" *Ethics* 109 (2): 287–337. https://doi.org/10.1086/233897

Braveman, Paula. 2006. "Health Disparities and Health Equity: Concepts and Measurement." *Annual Review of Public Health* 27: 167–94. https://doi.org/10.1146/annurev.publhealth.27.021405.102103

Crenshaw, Kimberle. 1989. "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics." *University of Chicago Legal Forum* 140 (1): 139–67.

Daniels, Norman, 2008. *Just Health: Meeting Health Needs Fairly*. Cambridge: Cambridge University Press.

Eyal, Nir. 2015. "Inequality in Political Philosophy and in Epidemiology: A Remarriage." *Journal of Applied Philosophy* 35 (1): 149–67. https://doi.org/10.1111/japp.12150

Eyal, Nir, Samia A. Hurst, Ole F. Norheim, et al., eds. 2013. *Inequalities in Health: Concepts, Measures, and Ethics*. Oxford: Oxford University Press.

Ferrie, Jane E., Martin J. Shipley, Katherine Newman, et al. 2005. "Self-Reported Job Insecurity and Health in the Whitehall II Study: Potential Explanations of the Relationship." *Social Science and Medicine* 60: 1593–602. https://doi.org/10.1016/j.socscimed.2004.08.006. Medline: 15652690

Fourie, Carina. 2012. "What Is Social Equality? An Analysis of Status Equality as a Strongly Egalitarian Ideal." *Res Publica* 18 (2): 107–26. https://doi.org/10.1007/s11158-011-9162-2

———. 2017. "The Sufficiency View: A Primer" In *What Is Enough?: Sufficiency, Justice, and Health*, ed. Carina Fourie and Annette Rid, 11–29. Oxford: Oxford University Press.

Koskinen, Seppo, Martelin, Tuija. 1994. "Why Are Socioeconomic Mortality Differences Smaller among Women than among Men?" *Social Science & Medicine* 38 (10): 1385–96. https://doi.org/10.1016/0277-9536(94)90276-3

Lloyd, Elisabeth A., 2006. *The Case of the Female Orgasm: Bias in the Science of Evolution*. Cambridge: Harvard University Press.

Lundqvist, Adam, Emelie Andersson, Ida Ahlberg, et al. 2016. "Socioeconomic Inequalities in Breast Cancer Incidence and Mortality in Europe—A Systematic Review and Meta-Analysis." *European Journal of Public Health* 26 (5): 804–13. https://doi.org/10.1093/eurpub/ckw070

Marchand, Sarah, Daniel Wikler, and Bruce Landesman. 1998. "Class, Health and Justice." *Milbank Quarterly* 76 (3): 449–67. https://doi.org/10.1111/1468-0009.00098. Medline: 9738170

Marmot, Michael. 2004. *The Status Syndrome: How Social Standing Affects Our Health and Longevity*. New York: Henry Holt and Co.

———. 2005. "Social Determinants of Health Inequalities." *Lancet* 365: 1099–104. https://doi.org/10.1016/s0140-6736(05)71146-6

McDonough, Peggy, David R. Williams, James S. House, et al. 1999. "Gender and the Socioeconomic Gradient in Mortality." *Journal of Health and Social Behavior* 40 (1): 17–31. https://doi.org/10.2307/2676376. Medline: 10331319

Moss, Jeremy. 2014. *Reassessing Egalitarianism*. New York: Palgrave Macmillan.

Mustard, Cameron, Jacob Etches. 2003. "Gender Differences in Socioeconomic Inequality in Mortality." *Journal of Epidemiology and Community Health* 57: 974–980. https://doi.org/10.1136/jech.57.12.974. Medline: 14652265

Parfit, Derek. 1997. "Equality and Priority." *Ratio* 10 (3): 202–21. https://doi.org/10.1111/1467-9329.00041

Phillips, Susan P., and Katrina Hamberg. 2015. "Women's Relative Immunity to the Socio-Economic Health Gradient: Artifact or Real?" *Global Health Action* 8 (1): 27259. https://doi.org/10.3402/gha.v8.27259

Porta, Miquel, ed. 2014. "Socioeconomic Status." In *A Dictionary of Epidemiology*. Oxford Reference, Online Edition. http://www.oxfordreference.com/view/10.1093/acref/9780195314496.001.0001/acref-9780195314496-e-1764?rskey=d1WEEI&result=1763

Potter, Elizabeth. 2006. *Feminism and Philosophy of Science: An Introduction*. First edition. New York: Routledge.

Powers, Madison, and Ruth Faden. 2006. *Social Justice: The Moral Foundations of Public Health and Health Policy*. Oxford: Oxford University Press.

Reeder-Hayes, Katherine E., Stephanie B. Wheller, and Deborah K. Mayer. 2015. "Health Disparities Across the Breast Cancer Continuum." *Seminars in Oncology Nursing* 31 (2): 170–77. https://doi.org/10.1016/j.soncn.2015.02.005

Robert, Stephanie, Indiana Strombom, Amy Trentham-Dietz, et al. 2004. "Socioeconomic Risk Factors for Breast Cancer: Distinguishing Individual-and Community-Level Effects." *Epidemiology* 15 (4): 442-50. https://doi.org/10.1097/01.ede.0000129512.61698.03. Medline: 15232405

Ruiz-Cantero, María Teresa, Carmen Vives-Cases, Lucía Artazcoz, et al. 2007. "A Framework to Analyse Gender Bias in Epidemiological Research." *Journal of Epidemiology and Community Health* 61 (Suppl 2): ii46–53. https://doi.org/10.1136/jech.2007.062034. Medline: 18000118

Tate, Charlotte Chuck, Jay N. Ledbetter, and Cris P. Youssef. 2013. "A Two-Question Method for Assessing Gender Categories in the Social and Medical Sciences." *Journal of Sex Research* 50 (8): 767–76. https://doi.org/10.1080/00224499.2012.690110

WHO. 2008a. *Closing the Gap in a Generation: Health Equity Through Action on the Social Determinants of Health*. World Health Organization.

———. 2008b. "Gender Equity." In *Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health*, 145–54. World Health Organization,

Whitman, Steven, David Ansell, Jennifer Orsi, et al. 2011. "The Racial Disparity in Breast Cancer Mortality." *Journal of Community Health* 36 (4): 588–96. https://doi.org/10.1007/s10900-010-9346-2

Wildeman, Christopher, and Emily A. Wang. 2017. "Mass Incarceration, Public Health, and Widening Inequality in the USA." *Lancet* 389 (10077): 1464–74. https://doi.org/10.1016/S0140-6736(17)30259-3

Wilkinson, Richard, and Kate Pickett. 2009. *The Spirit Level: Why More Equal Societies Almost Always Do Better*. London: Allen Lane.

Young, Iris Marion. 1990. *Justice and the Politics of Difference*. Princeton University Press.

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