

# Inequity and Unequalness in Health\*

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Economists have traditionally focused on the problem of poverty rather than inequality, seeing inequality itself as a problem only when it creates additional hardship for those at the bottom of the distribution. In looking at health inequality, this translates to the questions of when income inequality (not just poverty) hurts those in poor health and when health inequality (not just poor health) hurts those that are poor or have bad health. There are also inequities in health and healthcare based on race and gender. Other disparities in care do not systematically harm a specific group, but are indicative of inefficiencies in healthcare provision.

## 1 Poverty and health

Before focusing on inequality, I briefly discuss the link between poverty and health. This connection between health and income will naturally lead to a connection between income inequality and health inequality. The inequality itself is less of an issue than the poverty and poor health.

The link between poverty and poor health goes in both directions. Smith (1999) reviews many of the mechanisms. In the US, higher income people are more likely to be insured. The stress of poverty can cause psychological issues as well as physical problems. Both income and education are associated with smoking less (CDC, 2016). Cross country differences are also stark. The average life expectancy at birth is 79 years in the United States (78 in Europe) and only 60 years in Africa (Population Reference Bureau, 2016). Within the developing world, in addition to receiving less medical care, the poor often suffer from malnutrition.

Poor health can also contribute to poverty. Adverse health events can lead to job loss and early retirement. Medical care can be expensive, so illness can lead to decreased savings or bankruptcy (Mahoney, 2015). In developing countries, poor nutrition can make people less able to work and children less able to learn (Glewwe and Miguel, 2007). All of these

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contribute to a link between income inequality and health inequality, but they are effects of poverty and health, not of inequality itself.

## 2 Inequality

What about the effect of inequality per se? When does raising some peoples income, hurt the health of the poor? If health inequality rises because the health of the healthiest improves, how does that affect the poor and those in poor health?

### 2.1 Income inequality and health

Increased income inequality can lead to an increase in segregation (Watson, 2009). Segregation harms the poor in a myriad of ways, some of them directly health related. As Lindau et al. (HCEO) describe, segregated poor neighborhoods often lack sufficient health service providers and those that are there may be of poor quality; without wealthier residents, who have more resources to monitor providers and advocate for their care, the market incentives for quality care are limited. Poor areas may also have worse pollution and sanitation. The detrimental effects of segregation are not specific to health; they are closely related to other issues discussed in this volume, such as education and housing.

Conversely, increasing inequality by raising the incomes of the wealthy can also hurt the poor because health markets are *not completely* segregated. The poor use many of the same drugs and health services as other groups. If those groups' demand increases due to rising incomes, the poor may face higher prices or increased wait times. In markets where fixed costs or product complexity (or regulation) limit the variety of products, increasing incomes of the wealthy or middle class may decrease the availability of products attractive to the poor. For example, for those receiving completely subsidized insurance, the requirement that it cover preventive care for free is great, but for others who are struggling to cover the premium, the increased generosity of insurance demanded by a wealthy society may prevent them from buying the catastrophic insurance that they want.

It should also be noted that is theoretically possible for increased income inequality to have positive effects on the health of the poor. Some of the public amenities that people demand as they get wealthier – clean water, lead-free gasoline, non-smoking zones – also benefit the poor. Increased resources for those at the top of the distribution also means more research and innovation in healthcare, the benefits of which can partially accrue to the poor. However, the spillovers may be limited if the innovations are focused on products and services primarily consumed by those with higher incomes, as Jaravel (2016) finds in the retail sector.

## Research and market design

There has been work both trying to understand the distributional effects of health policy and actively trying to decrease the inequality in health. Ho and Lee (HCEO) show how the poor may be differentially effected when an insurance plan shifts to a ‘narrow networks’ to limit the use of high cost (and sometimes high quality) providers. Since the rich pay more Medicare taxes and everyone gets the same coverage, the program reduces (lifetime) inequality. However, Rettenmaier (2012), show that the variation in longevity and Medicare spending across the income distribution substantially reduces the progressiveness of the program. Lindau et al. (HCEO) describes the lack of access to and information about health services in segregated poor communities. They have designed a platform to facilitate information exchange to improve access to and utilization of health services in those communities.

Other efforts and research have focused on the inequality in health insurance coverage. Many poor people do not purchase health insurance. It may be unaffordable simply because they are poor or because income inequality has raised the costs of care and insurance. The government has tried to decrease this inequality in insurance coverage, both through providing coverage directly, under Medicaid, and through subsidies in publicly run markets for private insurance. In 2006 Massachusetts created *Commonwealth Care*, which provided substantial subsidies for the poor to purchase private insurance plans. In addition to expanding Medicaid, the *Affordable Care Act* (ACA) created similar markets or ‘insurance exchanges’ nationally in 2014. These policies were designed to keep costs down by harnessing competition in insurance markets while still providing the poor with (heavily) subsidized insurance.

In Jaffe and Shepard (2017), we look at the effect of the subsidy structure in these markets and show that the way in which the exchanges link subsidy levels to the prices set by insurers incentivizes *less* competitive pricing. Tebaldi (2016) also considers policies for improving the efficiency of subsidized insurance exchanges via age specific subsidies. Improving the design of these exchanges could allow them to cover more people at the same cost and thereby improve their effectiveness in decreasing health inequality. Conversely, rolling back the Medicaid expansion or making the subsidies less dependent on income, as proposed by many Republican “replacements” for the ACA, would likely have the opposite effect of limiting the exchanges’ ability to mitigate health insurance inequality.

Even for those with insurance, the prices for some treatments can be prohibitively high. Some treatments such as the Sovaldi – a hepatitis C vaccine – can substantially lower future medical costs, but are very expensive. Public insurance plans may not have the budget to cover this upfront cost. Montazerhodjat et al. (2016) propose targeted financial instruments

whereby such products could be paid for over time; they argue that since insurance companies receive much of the benefit from the lower medical costs in subsequent years, they should be liable for the debt payments for their enrollees. This proposal would only work if insurance companies were not allowed to discriminate against those with health debt, just as they are currently prohibited from discriminating against those with prior health conditions.

Telemedicine<sup>1</sup> and health ‘apps’ may dramatically change healthcare markets. This has the potential to mitigate or exacerbate the effects of income inequality on health. Urbanization and segregation have left the rural poor with limited access to health professionals; they could benefit greatly from the ability to access care remotely. However, the poor also have less access to cell phones and other technology that may be necessary for these new modes of treatment; so they may be particularly adversely affected if the technological changes decreases the availability of in-person care.<sup>2</sup>

## 2.2 Health inequality

While it is not standard to thinking of exogenously increasing health inequality, innovations in healthcare can increase the disparity in health outcomes for a given income distribution. There has been less work on the effects of health inequality itself so this discussion is necessarily more speculative.

The US has seen substantial increases in longevity over the past decades, but they have not been equally distributed. Nationally, 50 year old men in the bottom quintile of the income distribution have seen no gains in life expectancy since 1980 and women’s life expectancy for that income group has decreased. Meanwhile, over the same time period, 50 year old men and women in the top quintile have gained 7 and 5 years of life expectancy, respectively (National Academies, 2015). In Chicago, two neighborhoods 8 miles apart have life expectancies that differ by 16 years (Chicago, 2014). As a result of average increases in life expectancy, there has been extensive discussion of raising the retirement age, which would require the poor to work longer despite not living longer. If the retirement age is unchanged, benefits will have to go down or government spending will increase – either way the poor pay some of the cost despite not sharing in the benefits of increased longevity.

Again, in theory there are also potential positive effects of health inequality on the poor or sick. When healthy people get healthier they contract fewer diseases and therefore transmit fewer diseases. The poor could benefit from this positive health externality.<sup>3</sup> However,

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<sup>1</sup>Telemedicine refers to treatment or diagnosis by videoconference or other technology that allows the medical professional and patient to be in different places.

<sup>2</sup>Though, even if there are fewer in-person providers, time with providers could be less scarce if the technology dramatically increases the efficiency of care provision.

<sup>3</sup>Indeed, the sickest are most susceptible to many diseases, so they benefit most from population-level decreases in communicable diseases.

similarly to the shared-market issues discussed above, when the healthy get healthier, there may be less research and services focused on the health problems of the poor. The political demand for public provision of vaccinations and other basic services may wane and research dollars may shift towards treatment for non-infectious diseases such as depression and diabetes.

### **Research and market design**

International aid agencies and researchers have recognized the problem of ‘diseases of the poor’ – pharmaceutical companies have less incentive to develop cures or treatments for diseases such as malaria that mainly affect poor people. There is also a question of the best way to help poor people and countries afford existing treatments. Kremer and Williams (2010) discuss the optimal design of prizes and advance market commitments to incentivize development and production of drugs such as the pneumococcus vaccine. Baranov et al. (2017) study optimal procurement auctions under decreasing marginal cost in an effort to help understand how the Global Alliance for Vaccines and Immunisation can most efficiently help developing countries obtain existing treatments.

Domestically, though there is lots of work on health and poverty, there is less discussion of diseases of the poor specifically. Some researchers have argued that the scope of the problem is underestimated because there is insufficient tracking of infectious diseases, such as chagas, that are more prevalent among the poor in the United States (Hotez, 2008; Barry et al., 2013). Economists have studied the interaction of health and retirement (e.g. Zhao, 2014; Burkhauser et al., 1996; Gruber and Wise, 2009), but more work on its interaction with inequality is needed.

## **3 Non-income related inequality in healthcare**

There is lots of disparities in health and healthcare that are unrelated to income. Some of them seem inevitable – some people get sick and others do not; some of them are good – sick people receive more healthcare. Some of them are bad in that they suggest potential inefficiencies – if two identical people get different amounts of care then probably one of them is receiving too much or too little. Others are not just disparities, but inequities; they are bad because they are unjust – inferior care provided because of race or gender.

### **3.1 Inequities**

Because of the differing poverty rates, income-related health inequalities will generate disparities in health among Blacks, Latinos, and Whites, even absent any direct relationship. However, work that attempts to disentangle the two still finds substantial differences in medical expenditures and treatment by race (see Fleurbaey and Schokkaert, 2011, and cites therein). Even among children with appendicitis, blacks are less likely to receive opioid

pain killers<sup>4</sup> for severe pain and more likely to have moderate pain untreated (Goyal et al., 2015). While potentially widespread, these individual-level inequities, are harder to address via market design, though the efforts to improve efficiency through best practices and standardization of care may help.

There are also sex-based inequities in healthcare provision. One study found that women were less likely to be given pain killers and more likely to be given sedatives post-surgery (Calderone, 1990). (Though another study with a larger, but less well controlled patient pool found that women received more follow-up care (Verbrugge and Steiner, 1981).) Until 1993, women were excluded from many drug trials; they are still under-represented and many studies do not look separately at the effects and side effects of drugs for women (Johnson et al., 2014). This can bias drug development towards drugs that are more effective and have fewer side effects for men than for women. Recently there have also been calls for inclusion of more older adults in clinical trials to learn about the differential effects of treatments on the elderly (Herrera et al., 2010).

### 3.2 Inefficiencies

There are other disparities in healthcare that suggest potential inefficiencies in treatment, but not necessarily inequities. There is large geographic variation in the quantity of care received by Medicare patients (see, e.g., Wennberg et al., 1998; Skinner, 2011). The lack of evidence of differences in outcomes suggests that some regions are providing more unnecessary care. However, Cooper et al. (2015) find less quantity variation among the privately insured population, questioning the idea that some hospitals or regions have the habit or standard of doing more testing and treatment across the board.

There is also substantial within region variation in the quality of care. While there is some evidence that higher quality hospitals are larger and gain market share over time (Chandra et al., 2016a), low quality hospitals remain in many markets. Both the Center for Medicare Services (CMS, 2016) and state governments (e.g., NYS Dept of Health, 2016) have tried to improve consumer information about the quality of providers. Research shows modest effects on consumer choice (Glascoff, 2000) and that hospitals do improve on the measured outcomes, but also attempt to game the ranking system (Dranove, 2003). Hopefully this research can be used to improve future ranking systems.

The quality of care at a given hospital can also vary over time. Stochastic healthcare needs generate intermittent congestion. Researchers have looked directly at the effect of congestion on care (Fiedler, 2013) and used variation in congestion as an instrument for marginal patients receiving capacity-constrained services; for example, Freedman (2016) use demand

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<sup>4</sup>While the opioid epidemic cautions against the use of opioids for long term pain, they are still considered the best treatment for acute pain.

fluctuations to provide evidence that the value of neo-natal intensive care for marginal babies exceeds the costs. Hospitals also have variation in staffing levels. Jena et al. (2015) show that during national cardiology conferences (when one expects there to be *fewer* cardiologist staffing a hospital) Medicare cardiac patients have *lower* 30 day mortality; again suggesting inefficiency from the over-provision of care.

Any industry would increase output if all producers were given the productivity of the most productive. The evidence suggests that there is no more productivity variance in healthcare than in other industries (Chandra et al., 2016b). Nevertheless, lower productivity in healthcare often costs lives or health instead of just firm profits, so research on what works is valuable. Reducing inequality in productivity requires understanding its sources; economists can use natural experiments and statistical techniques to estimate the effectiveness of practices or systems that are not suitable to the random trial framework of the medical literature.

### **Drug Shortages**

The question of how to allocate limited supply among hospitals or among patients within a hospital is an efficiency issue ripe for market design. Drug shortages are a prime example. Though policy changes and regulatory efforts have decreased the number of drug shortages from the record highs seen in 2012, they are still fairly common (GAO, 2014; Fox, 2014). Changing how Medicare pays for drugs or how the FDA regulates generics could improve the incentives for entry and production in an industry with high fixed costs and relatively low marginal costs. However, some shortages may inevitably result from fluctuations in demand and production interruptions. Allocating drugs to the highest value consumers during these shortages would improve efficiency and health.

Unfortunately secondary drug markets are very limited, due partially to a general aversion to extracting consumer surplus for life-saving medication and to formal price-gouging laws in some states; there is also a concern that these ‘gray’ secondary markets generate profits for wholesalers and not the manufacturers (Hemphill, 2015).<sup>5</sup> Because the markets are not condoned, it is hard for pharmacists to verify the quality of resold drugs – they may have been repackaged or inappropriately stored. A central market could certainly help track quality. It may be able to overcome price gouging concerns – perhaps with the cooperation of lawmakers – or it could potentially setup a non-monetary market as in Prendergast (HCEO).

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<sup>5</sup>The economics behind this last concern is not entirely clear. While society wants drug manufacturers to earn sufficient profits to incentivize innovation and continued production, it would decrease the incentive to maintain supply continuity if they made profits specifically from shortages

### 3.3 Unequal health

Even absent any inequity or inefficiency there will still be, at least with today's technology, substantial inequality in health: some people get sick and others do not. For the most part, helping the most disadvantaged (sickest) patients falls in the realm of medicine, but there have been some non-medical, market design efforts. One of the largest is *PatientsLikeMe*, an online platform where patients with chronic illnesses share their experiences and connect with others with the same disease. In addition to the community it provides individuals, the aggregate data collected is useful for research on treatment efficacy and side effects (PatientsLikeMe, 2016).

Research on the financing of medical innovation also aims to help the sickest patients – those with currently untreatable diseases. To increase funding for biomedical research, Fernandez et al. (2012) propose that instead of having each drug start-up independently procure venture capital, a single fund could invest in multiple drug development programs; by creating a large, diversified portfolio, it would substantially reduce the risk relative to each individual investment and allow debt financing of drug development.

## 4 Conclusion

In addition to the direct link between poverty and health, there are a variety of ways in which inequality can affect the health of the poor. Income inequality can make it harder for the poor to obtain health services; health inequality can exacerbate poverty. Inequalities in care also reflect non-income related inequities and inefficiencies. There has been lots of research on the functioning of health markets and the interaction between income and health, of which this chapter necessarily references only a small fraction. More work on the relationship between health and inequality, as distinct from poverty, is needed.

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