Ethics and Waiting Times

Incorporating theories of justice in an analysis of health care waiting times in Sweden

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Abstract (English)

Objectives: There is growing concern regarding waiting times in health care as a mechanism to improve fairness in health services. This essay addresses the issue by evaluating fairness defined by justice theories. Based on this discussion, the essay then investigates whether actual waiting times are consistent with ethical principles.

Theory: The theories of justice discussed are utilitarianism, egalitarianism and maximin. The discussion reveals that analysis of waiting times may better capture fairness objectives by incorporating these ethical principles.

Quantitative Analysis and Results: Swedish waiting times 2011-2017 were analysed, where the public priority-setting guidelines were evaluated in terms of ethical principles. A fixed effects model and descriptive statistics found that actual waiting times only partially correspond to the guidelines.

Conclusions: The 'fairness' of waiting times depends on how it is defined by justice theories and official guidelines. Future research may build on the incorporation of justice theories into waiting time analysis or strengthen the econometric analysis.

Abstrakt (Svenska)

Väntetiders förmåga att ge upphov till rättvisare fördelning av vårdjänster är vida diskuterat. Denna uppsats analyserar väntetider genom tre rättviseteorier: Utilitarianism, egalitarianism och maximin. Uppsatsen visar att analys av väntetider förbättras genom en mer uttryclig rättvisedimension. Principerna kopplas sedan till faktiska väntetider i Sverige 2011-2017. Trots en del brister i den kvantitativa analysen, är uppsatsens uppfattning att väntetider inte helt reflekterar officiella rättvisemål gällande väntetider. Ytterligare undersökningar kan bygga på den teoretiska diskussionen eller förbättra den ekonometriska analysen på en fallstudie.

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Introduction

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The growth of the health sector in most developed economies has led to rising concern about the capacity of health care to meet demand (Mather III et al., 2014; Siciliani and Verzulli, 2009). This is particularly alarming when health care is mostly funded through public expenditure, as over-utilisation of health care services then presents an inefficient trade-off to other public services (Scheunemann and White, 2011).

When policy-makers are reluctant to limit health care expenditure through price-rationing, queues or waiting lists are often seen as more equitable (Iversen and Siciliani, 2011). However such a demand-adjusting policy may then require guidelines to encourage a fairer distribution of treatments[1]. (Siciliani and Hurst, 2005). Several countries such as Sweden, Norway, and England have done so through implicit or explicit means (Hanning, 1996; Olsen, 1997; Laudicella et al., 2012).

A priority-setting system should reflect the special characteristics of the health care industry: Sufficient health status is necessary to enjoy other aspects of life. Also, lack of health care is associated with suffering and further decay of health. It is therefore fair to say that the economic analysis of health and health care benefit from special attention to ethics (Hauck et al., 2004; Ferraz, 2015). A wider inclusion of ethics in the analysis of health economics is also consistent with the growth of incorporating ethics into other fields of economic such as game theory and environmental economics (Konow, 2003).

Additionally, policy-makers are keen to establish a sense of fairness in how care is prioritised or rationed, but also reluctant to make explicit references to priorities (Magnussen et al., 2009). By incorporating justice theories into the analysis of health care waiting times, it is easier to diagnose the interaction between different dimensions of 'fairness', and hence design policy more consistent with fairness ideals.

To my knowledge, very few works have explicitly linked waiting times to theories

[1] 'Treatment' henceforth includes all aspects of health care contact which may involve waiting times; counselling, examination, and operations.

of justice. A paper by Arvidsson (2013) links theories to primary care priority-setting in Sweden, however she makes limited effort to generalise the use of the theories of justice. Literature of other related topics are concerned with whether individual or socio-economic characteristics affect access to health (e.g. Siciliani and Verzulli, 2009) or broadly discuss fairness in health care provision. By analysing waiting times explicitly from a justice perspective, this essay addresses a gap in surrounding literature.

Finally, a clarification about waiting times: Waiting times can refer to physically queuing in a health centre, such as three hours. Or, waiting times may refer to the time spent waiting between expressing demand for treatment and obtaining it (Tingshög et al., 2014), for example two months. This essay will evaluate the latter concept.

Choice of Sweden as case study

Like in many countries, waiting times are a great cause of public concern in Sweden. Excessive waiting times have been a highly debated issue since the 1980's (Hanning 1996) and continues to be the subject of much debate. The article run by the Swedish newspaper SVenska Dagbladet, "Waiting times kill" (Nordlund, 2017) highlights the importance of the issue.

Additionally, there is some evidence that the perception of waiting exceeds actual waiting time and that patients have little understanding nor inclination to agree with priority-setting guidelines (Arvidsson, 2009). From an empirical point of view, Sweden also offers access to some data on waiting times.

Lastly, the health care system of Sweden provides an interesting case study. The health care system is characterised by a large public provision of health care, equity concern and public participation (Magnussen et al., 2009). A sense of solidarity ingrained in the consciousness of both governance and people (as suggested by Magnussen et al., 2009) make it more appropriate to incorporate theories of justice into policy.

Objectives and plan of investigation

This essay has three related objectives. The first objective is to inspire deeper reflection on the use of waiting times as a distribution mechanism of health care; to question assumptions on the often glossed over ethics of waiting times. The second aim of this study aims to establish the underlying ethical principles which constitutes priority-setting of waiting times in health care.

Furthermore, I then bring this theoretical discussion into the empirical realm by applying the normative argument in the context of Sweden in recent years. Above all, this study seeks to answer the following questions: Are waiting times in Sweden consistent with any ethical principles analysed? Do the observed waiting times - as designed by policy makers - correspond to fair rationing?

This essay is divided into two main sections in addition to the final conclusion. The first large section is a theoretical discussion which goes into depth regarding the normative arguments on waiting times in health care. After clarifying some key concepts (section 2.1), each of the three theories of justice will be discussed in the context of waiting times in health care (section 2.2): Utilitarianism, egalitarianism and maximin. The succeeding section (2.3) holds a brief discussion on the effect on analysis of waiting times of incorporating the justice implications outlined in the prior section.

With this theoretical background, the essay then moves on to a case study of Sweden. I will begin by introducing health care and waiting time policy in Sweden (section 3.1). This is followed by a fairly brief quantitative analysis which ties the theoretical discussion to empirical insights (section 3.2). Finally, the last section discusses the findings in terms of the objectives of the essay (section 4) before closing the essay with a conclusion.

Theoretical Discussion

2.1 Clarification of key concepts

Definitions on the subject of ethics as well as waiting times in health care vary widely. Here I strive to define some concepts to facilitate the discussion in latter sections.

Justice in health care

Justice in health care can mean procedural or distributive justice. *Procedural justice* relates to the justice of the process through which decisions and policy are formed. Several studies (such as Arvidsson et al., 2012) found that individuals care more for procedural justice than distributive justice. *Distributive justice* pertains to whether a distribution - the status quo or the state as due to a redistributive policy - is just (Olsen, 1997). It is under this heading that the three theories of distributive justice fall under.

For several reasons this essay will focus on distributive justice. The first reason is that on the subject of waiting times in health care, where essential priorities have to be made on who shall and who shall not receive treatment, is clearly linked to the distribution of access. Another reason is that distributive justice is more closely related to the economic concept of scarcity; by focusing on rationing as an economic tool, the essay will be able to frame the discussion in a familiar framework. Fairness in this essay means it is *consistent with the theory or theories of justice discussed.*

Equity and Equality

Definitions regarding equity and equality are overlapping to the extent it sometimes becomes a semantic point. Calltorp et al. write: "While 'inequalities' usually refer to mere descriptive differences between various groups, 'inequities' are perceived to mean social differences that are deemed to be unjust " (2009, p 214). This suggests that inequality is a measurable concept, whereas equity imposes a value judgement on whether the inequality is unjust.

This distinction between equity and equality can be extended to the concepts of individuals' endogenous and exogenous causes of health inequality. It is an assumption throughout literature that endogenous inequality, for example wealth through lower effort or work preference, is fair even under egalitarian principles (Dolan and Olsen, 2001). Health inequality can hence be equitable if the inequality is merely due to health behaviour or preferences. The essay will proceed such that equity corresponds to fairness and consistent with ethical principles, whereas inequality is descriptive of a certain measure or state.

Equity in *health* vs equity in *health care*

An obvious distinction is made between equity in health and equity in health care. Research for the past decade or two in health economics has moved from researching inequality of health care to inequality in health (Zweifel et al., 2009) . This is primarily because focusing on health care neglects other determinants of individual's health (Calltorp et al., 2010): These include for example social and physical environment, information and sanitation (Marmot, 2008). Nevertheless, despite foregoing some dimensions of health determinants, this essay will study inequity and inequality of health care via health care waiting times.

Priority-setting vs rationing

At times, the terms priority-setting and rationing are used interchangeably to describe restrictions in supply. Indeed, many sources emphasise the confusion surrounding which term is more appropriate (e.g. Sheunenmann and White, 2011), with some authors favouring 'priority-setting' throughout because of negative connotations related to the term 'rationing'. However, this essay will as according to some norms define the two terms in a macro or micro sense. *Priority-setting* is defined as the public and administrative guidelines governing aggregate distribution of resources to the health care. *Rationing* is defined as the case-to-case decision faced by health care professionals on whether to start or continue treatment of a patient. Unless infeasible, these two definitions apply.

2.2 Theories of justice

Theories of distributive justice are traditionally concerned with just allocations of goods and resources in society. This essay will contribute to the discussion by linking theories of justice specifically to health care waiting times, which is the main

objective of this section.

As stated previously, the three theories of distributive justice in this essay refer to: Utilitarianism, egalitarianism and maximin. Below, each theory in turn will be discussed. First some background will be provided about the theory, and how the theory has been incorporated into health care analysis. Next, this reasoning will be applied to the specific area of waiting times in health care. The main points for each theory will be encapsulated in Statements that are listed again in the appendix. The function of these Statements is to substantialise the discussion using real applicable examples, in order to refrain from the discussion becoming distanced from real-world scarcity and choices. The Statements are thus the final step in linking justice theories to the analysis of waiting times.

2.2.1 Utilitarianism

Background

Utilitarianism in its modern form originates from John Stuart Mill. He argued that 'the greatest happiness principle' supported the subscription to utilitarianism since actions and outcomes are better the more happiness they yield[1] (Mill, 1863; as quoted in Olsen, 1997). This sense of happiness is normally denoted utility.

Utilitarianism holds two important characteristics in economic thought: Individualism and consequentialism. Individualism refers to utilitarianism as identifying the best outcome based on the sum of individual utility: the sum is no greater nor less than its parts. The implications of this is that there is no intrinsic value attached to the distribution of utility.

Consequentialism refers to the concept that what is best only refers to a consequence of a new outcome or policy. In other words, utilitarianism would rank the utility-maximising outcome only in incremental gains or losses following a departure from the status quo. It does not matter what the initial or ex post *levels* of individuals are. These two characteristics also imply respect to *net benefits* of a new outcome: The utility-maximising state is the one with the best balance or ratio between gains and losses (Konow, 2003).

Utilitarianism is incorporated into standard consumer and welfare theory by monotonic preferences - that is, that more is always better or at least never worse -

[1]Mill also makes a distinction between high and low pleasures. Since the distinction between these imposes a value judgement, there is already the possibility to depart from strict utilitarianism by incorporating some forms of equity as a high pleasure. Nonetheless, this essay will forego this departure and thus stay consistent with basic welfare economics.

and by respect to net benefits. The best outcome is one where the aggregate level of utility is maximised and it is Pareto efficient. Efficiency is thus an ethically consistent outcome if individuals prescribe to utilitarianism.

Utilitarianism in health care

The key question in answering what utilitarianism is in health care is to answer *maximisation of what?* If there is no regard to costs, health care should be maximised until the marginal utility of consuming more health care equals the disutility of obtaining health care such as time costs (LeGrande, 1987). Incorporating a cost dimension acknowledges the loss of alternative use of resources when spending on health care. The best outcome is then the equalisation of marginal utilities of potential patients given the budget constraints (Hauck et al, 2004). This implies that the utilitarian best outcome is the maximisation of an efficiency-cost ratio. In health economics and evaluation, this is often equal to maximising Quality-Adjusted Life Years (QALY) per monetary unit (Zweifel et al., 2009a).

The intrinsic individualism and consequentialism of utilitarianism extends into the health care application. Individualism means that each individual - in this case potential patient, is assigned the same social value, namely 1/population. The consequentialist aspect of utilitarianism implies that the choice is to maximise aggregate incremental gain; there is no respect to the distribution or absolute level of health. Such a view can certainly be considered extreme in isolation.

Another issue is how the ranking of both efficiency (QALY) and costs should be accounted. Firstly, there are certain arguments as to whether welfarism is a suitable paradigm. For one, the objectives of health care individuals do not necessarily agree with assumptions in standard theory (Morris et al., 2007). This aggregation of individual utility also means that the distribution and preferences of patients, such as community values, are ignored (Olsen and Donaldson 1998).

Utilitarianism in waiting times

The most obvious place to start when applying utilitarianism to waiting times, is the suggestion that priority should be given to patients with the highest capacity to benefit. Recalling that QALY incorporates both the quantity of years and quality of life, priority in health care should be given to individuals who may gain many years from treatment, may have a huge effect on their quality of life, or both.

The welfarist cost-benefit dimensions would also make the argument that all other things being equal, patients should be discriminated against based on estimated

cost per gain. Hence, the two most important characteristics of utilitarianism - individualism and consequentialism - is incorporated into the idea of just waiting times.

In reality, estimating the cost-effectiveness (or effectiveness-cost) ratio is more difficult than immediately perceived. Indeed, often care is sought in order to help identify the health status. For one, QALY relies on the assumption that a ranking of health statuses and ailments is possible, but in practise the method is ripe with flaws (Nord et al., 1995; Morris et al, 2007). Another point is that often the gain from a treatment is uncertain, and rankings must then rely on expected values.

In a fully informed ideal scenario, each patient is able to attach a precise numerical value to the QALY/COST ratio gain from treatment. The place in the waiting list would then be a perfect ranking. However, knowing that the costs and benefits are not identifiable due to both conceptual and administrative barriers, waiting times should correspond to at least a logical expected value of potential gains. Health care services should therefore be directed to prioritise shorter waiting times where the difference between treated and untreated QALY is expected to be the largest.

Statement 1 suggests how the principles of utilitarianism could be applied in some concrete cases. Statement 1a captures the sense of capacity to benefit, which is consistent with both the preceding discussion and some empirical studies that individuals feel strongly about preventing mortality and strong suffering (Hauck et al., 2004). Statement 1b incorporates the cost-effectiveness principles related to utilitarianism and welfare analysis.

Statement 1a: *Utilitarianism suggests that waiting times should reflect the capacity to benefit and maximise the actual change in health. The most straightforward metric is that, all else being equal, a younger person should be prioritised ahead of an older person.*

Statement 1b: *Utilitarianism suggests that all other things being equal, the treatment with the least costs per gain in QALY - or equally the treatment maximising QALY per monetary unit - should be chosen.*

2.2.2 Egalitarianism

Background

Defining egalitarianism depends wholly on how one determines where from egalitarianism originates; an argument can however be made that western concepts of

egalitarianism has its main foundations in christian, libertarian and socialist thought (Konow, 2003). As suggested by the name, egalitarianism advocates equality - however, what is to be equal or distributed equally? Since it can be assumed that total equality of everything is both infeasible and undesirable due to different preferences (Konow, 2003), egalitarianism is more commonly applied less universally. When the distribuendum (that which is to be distributed) is a specific good or group of goods it is thus called *specific egalitarianism* (Olsen, 1997, p 627 particularly).

Egalitarianism is integrated into economic evaluation by attaching greater weight to the net benefits of lower income groups given a new outcome (Zweifel et al., 2009), or more generally in agents-based analysis by incorporating an equitable distribution of income into consumer preferences. The application of egalitarian dimensions in economic studies also often prescribe to the distinction between endogenously and exogenously caused inequality (cf section 1).

Egalitarianism in health care

As with egalitarianism in general, the main question is what dimensions in health care services should be equal. I will briefly outline the main ones suggested in literature. They can be divided into three groups; equality in health, equality in contribution and equality in use.

Strong egalitarianism implies that all individuals should have the same health (Hauck et al., 2004). Hence, individuals with good health should be denied care and individuals with very poor health should receive health care until they reach the average health level, regardless of costs[2]. This is related to the concept of 'fair innings' in that all individuals are entitled to a set amount of QALY's, so that people above this level are living on 'borrowed health' and individuals below this level are being denied a right (Williams, 1997). One of the main ethical obstacles to this kind of equality is that it completely disregards health behaviour and health preferences (Hauck et al., 2004), and one of the main practical issues is that it relies on a comparative QALY indicator. Strong egalitarianism also implicitly makes the assumption that health care can fully adjust differences in health, which many authors object to (Arvidsson, 2013; Ferraz, 2015).

A weaker form of egalitarianism would then acknowledge that individuals have different capabilities and needs to access health care. A contribution-based egalitarian system would let health care access depend on the (financial) contribution to the system of individuals. This provides a connection to libertarian thought; access to health care should perfectly reflect the contribution to the health care system. Such

[2]Under the assumption that health care is the main determinant of health.

a view would essentially see health care services mirror a liberal market system, with its associated characteristics. The main argument against such as system is that it would significantly disfavour low income takers which goes against the (non-libertarian) principles that govern most health care services.

The third approach to egalitarianism would see equal use or equal access to the health care system. To implement equal access to health care policy-makers could equalise ability to pay for health services, or suppress the ability to pay as a determinant of access (Zweifel et al., 2009). Practically, the former then implies a wider redistribution of income or positive discrimination in access for low-income takers. The latter policy implies that the government should provide services free or at a low charge. It could also imply a general lottery system, but then the distribution of access fails to incorporate any respect to need (Hauck et al., 2004).

Hence, many authors discuss an 'equal access for equal need' policy in health care (Hauck et al., 2004). In practice, there should be no variation in access across geographical area or socio-economic characteristics of the care-seeker (Morris et al.,2007). The 'equal need' component suggests that there can be some variation in the access to treatments; for example, the access to emergency care may ascend the access to physiotherapy as long as it is the same across individuals and regions.

Egalitarianism in waiting times

I argue that strict egalitarianism is unfit for waiting times in health care; it seems inequitable to suggest that waiting times should be equalised regardless of reason for and type of treatment. The most relevant concept of egalitarianism appears to be "equal access for equal need". Applied to the context of waiting times, equal access denotes the length of waiting and what is sought to be accessed is the opportunity to be treated. Defining *equal need* then remains as the difficult aspect but could be approximated by comparative quality of life presently or after treatment.

Egalitarian priority can further be defined as the health status of the individual compared to average population health. As touched on earlier, this requires individuals to communicate and know their health status. This definition of need implies that an egalitarian view on waiting times also should incorporate some care about the distribution of health. In this sense, given that two patients have potential equal gain from a disease, the patient that should be treated should be the one with health status more below average health. It can be noted that this view connects to the utilitarian Statement 1a, however there is a different perspective on the role of capacity to benefit. The common factor for the egalitarian different views is that they all suggest that socio-economic characteristics should not affect treatment, and

that capacity to benefit is secondary to severity and equality.

In the ideal, perfect information scenario there should be a way to perfectly rank which health treatment indicates the most need. Waiting times should reflect this need, so that relatively more resources go to treatments where the need is greater. Care-seeking individuals then wait accordingly and characteristics nor ability to pay have an impact on the waiting time. Health care services are made cost sustainable by primarily deprioritising individuals who post treatments will be the furthest above (or below) average health.

Again, the real scenario is subject to information limitations. Given this reality, it is not possible to provide the same priority across treatments. The best way to proceed is then to set equal access for the *same treatment of the same illness*. Hence, Statement 2a is consistent with the egalitarian requirement that access should not depend on who and where care is sought. Statement 2b represent the egalitarian concern for distribution.

With respect to an equity dimension, longer waiting times for self-induced need for treatment rather than those caused by shocks (ceteris paribus) would also be fair under egalitarianism (Dolan and Olsen, 2001). However, it is empirically and conceptually difficult to decouple health status induced by lifestyle from other components affecting health. Additionally, the cause of lifestyle choices might reflect structural issues for which it would be unethical to punish individuals (e.g. Finkelstein et al., 2005). It is therefore difficult to make the argument that waiting times should for example be longer for treatments related to smoking.

Statement 2a: *Egalitarianism in terms of 'equal access for equal need' suggests that waiting times should be the same for individuals applying for the same treatments and not depend on geographic position or socio-economic status of the care seeker.*

Statement 2b: *Egalitarianism suggests that when a treatment with the same cost will lead to the same health gain for two individuals, priority should be given to the individual who after the treatment will be closest to average health.*

2.2.3 Maximin

Background

As opposed to utilitarianism and egalitarianism, maximin is a 20th century theory with its roots firmly in distributive justice. The main developer of the maximin theory is by Rawls (1971) partially using a conceptual method and thought experiment

developed by Harsanyi (1955). The starting point is the concept of the original position where people are behind a veil of ignorance. Essentially, the original position involves all society's members negotiating the distribution of say income, while being rational, fully functioning members of the society, and knowing the resources of their society. The veil of ignorance means that while individuals hold knowledge of all socio-economic characteristics of their society, they do not know their own socio-economic position - and thus not how the distribution of income would affect themselves.

Rawls argued that in these circumstances all individuals, holding the same level of knowledge and rationality, would choose two justice principles; the first one to ensure equal political rights, and the second a minimum difference principle (Konow, 2003). Rawls states that the minimum difference principle is understood as follows: "all social primary goods - liberty and opportunity, income and wealth and the bases of self-respect- are to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favoured" (1971, p 303). When comparing scenarios where the worst off are equally badly off, the decision is based on the second least off and so on (Olsen, 1997). The maximin outcome is connected to utilitarianism since individuals do in fact maximise their expected utility; the cause of the difference in distribution is that when the decision is made individuals facing uncertainty take a risk-averse stance (Gaus and Thrasher, 2016).

The maximin distribuendum diverges from utility. Rawls instead states that the distribuendum should be the set of primary goods quoted above - food, shelter and security - which are goods necessary for other activities. Here he makes a connection to needs-based egalitarianism, since the argument is to provide an equal level of the most needed (primary) goods (Konow, 2003). Rawls (1975) does not include health in these, implicitly assuming that all individuals have full health. The minimum difference principle has been criticised on mainly two counts. First, that agents exhibit overly risk-minimising behaviour (Olsen, 1997) and that the assumptions on rational and fully functioning individuals are a narrowly defined scenario.

Maximin in health care

Despite Rawls decision to exclude health from primary goods, subsequent authors have proceeded with the idea that health is a primary good. Rather than questioning Rawls' conclusion from the outcome of the original position, literature discussing the ethics of health care tend to go straight to applying the minimum difference principle to the context of health (Morris et al., 2007)

The maximin approach in the health care context suggests that priorities should

be set to maximise the outcome for the worst off. The follow up question - worst off how? - deserves some attention. If keeping consistent with Rawls' general theory, the worst off are those who have the least amount of social and economic opportunity, which can be proxied by those with lowest income. In this case, a maximin distribution of health care would prioritise access to low income takers either explicitly (through for example income ceilings in access) or implicitly, by making the ability to pay matter less or not at all. In this context maximin has a clear connection to egalitarianism.

The more common notion is that the worst off are defined as the set of individuals who will have the worst health if left untreated (Schunenmann and White, 2011). This may for example include giving priority in cases of mortality-prevention or alleviating great suffering. Such an approach suggests two things. Firstly, the theory disfavours those who have 'only' fairly bad health but great capacity to benefit from treatment. Secondly, the theory favours those with decaying health. This view can therefore be understood as a consequentialist approach similar to utilitarianism, in that the levels of health are less important than potential gains. Mortality-prevention or easing end-of-life-suffering is often called a 'rule of rescue' preference.

An additional dimension of incorporating severity of a disease is to prioritise treatment of communicable diseases or ailments affecting more than one individual. Hauck et al. (2004) discuss a minimum package which relates to these diseases may for example be pregnancy related care tuberculosis control, and control of sexually transmitted diseases. These should be provided effectively with little or no pay since failure to treat would likely result in decaying health status for more than one individual. This is consistent with the 'worst off if untreated' approach, as the cost-savings from providing these packages prevent negative QALY externalities.

Maximin in waiting times

Following the previous section, priority-setting according to the maximin principle is defined under the assumption that it seeks to maximise the health gain of those who are worst off if not treated.

Hence, waiting times according to maximin should prioritise those who will be the worst off if left untreated, i.e. respect to the severity of the illness. Contrast this to the utilitarian view, where capacity to benefit refers to health status post-treatment. Rather, maximin would hold that the emphasis is on preventing that this patient reaches the worst level of health, that is, to make prioritisation choice based on severity if left untreated. Hence, under the maximin-based waiting time system, the individuals that would have to be primarily deprioritised are those with the highest

health status without treatment.

In a real world scenario, it is not possible to perfectly estimate each individual's response to treatment as well as the non-treatment effect on health. Working under expectation assumptions, the treatments that should have shorter waiting times can be defined as those preventing decaying health leading to higher mortality risk, and the measures discussed with the 'minimum package' that have externality effects.

Concretely, Statement 3a relates to prioritising waiting times where patients have an expected high mortality risk if left untreated. For example, Iversen and Siciliani (2011,p 650) notes that waiting times for elective procedures like hip and knee replacement tend to be higher than more serious issues such as coronary bypass, so Statement 1a reflects this notion of severity.

Statement 3b is based on the discussion above, and advocates prioritising pregnancy and maternity care as an example of limiting severity of disease that goes beyond one patient; both the mother and child can be at risk if being denied care, particularly directly related to delivery. Note that a similar argument could be made regarding limiting proliferation of infectious diseases. For example, consider a virus with a 1% risk of mortality but which is extremely infectious and can be estimated to spread to the majority of the population if not limited. Treating the first instance of the disease, even if there are no effects on this particular individual, would still be hugely beneficial in the aggregate.

Statement 3a: *Maximin suggests that waiting times should reflect the severity of the disease, and in particular the severity if left untreated. Hence, care-seekers with great mortality risk or suffering should expect shorter waiting times. This means treatments such as hip or knee replacements should be deprioritised in favour of for example palliative, cardiac and cancer patient care.*

Statement 3b: *Maximin suggests that pregnancy and maternity care should have shorter waiting than those with otherwise equal health gains, since the gains in health should count both mother and the child.*

2.2.4 Interactions and trade-offs of theories

Can a society in any one scenario be fair with respect to all three theories simultaneously or is there an inherent trade-off? At first glance the three theories argue from completely different perspectives and do not seem to have the ability to be consolidated more than on a superficial level. However, when unpacking the Statements 1-3, there are some areas which can be unified. This section aims to distinguish

Table 2.1: Distribution Scenarios

	A	**B**	**C**	**D**	**E**	**F**
Healthy	8	8	8	10	6	8
Mid	8	5	3	9	5	5
Ill	8	4	2	1	4	5
Sum	**24**	**17**	**13**	**20**	**15**	**18**

between agreement and trade-off for the three theories of justice.

First, the three theories will be in agreement when there is a strictly dominating outcome; an outcome that has the highest net benefits, the highest benefit for the worst off and the most egalitarian distribution of health. Consider Table 2.1, where the numerical values represent hypothetical health statuses for three individuals (or if you wish, society grouped into three segments). The numbers are purely a comparative arithmetic exercise. In the 1-10 scale 10 denotes perfect health and 0 means death. When comparing columns A-C, column A is clearly the preferred outcome for all three theories.

However, when outcomes lead to trade-offs between the three objectives, which perhaps is a more realistic scenario, the theories will lead to different outcomes being favoured. Such is the case when comparing columns D-F in Table 2.1, where the outcome would be different under each theoretical principle. Here, column D corresponds to utilitarianism, E to egalitarianism and F to maximin. A decision-maker is therefore forced to consider the trade-offs between each outcome.

When evaluating the trade-offs it becomes important to distinguish between aggregate priority-setting and micro-level rationing, since the trade-off for either is different. First, let us continue under the assumption that a policy-maker is choosing a priority-setting scheme to govern aggregate resource distribution.

One way to choose distributions is to rank outcomes based what is gained (e.g. in equity) and what is given up (e.g. in efficiency). For utilitarianism, while total health is maximised it neglects any distributional elements of health. Looking at Table 2.1 and the utilitarian column D, the difference between the mid health and low health persons is vast. The converse is true for the egalitarian distribution (column E). While the most equal distribution, it foregoes the highest total health.

Meanwhile, the problem with maximin (column F) is in literature defined as completely neglecting levels of health unless for the worse off (Hauck et al., 2004).

Imagine a situation with twenty or a hundred social groups instead of three, but the distribution choice is solely based on *one* group - even if it is indeed the one that is worst off. Williams (1997) expresses this as an extreme take on the view that those already penalised in health - such as having bad luck - should not receive further misfortune by not receiving health care (p 118). This narrowness of maximin leads to equally extreme trade-offs in this case. Hence, all three theories can be evaluated in terms of their trade-offs.

Finally, a ranking of distributions can integrate a cost dimension to determine the choice. In the aggregate, the cost of pursuing different health distributions has two main opportunity costs: The foregone alternative of spending public resources on other segments in society, and the trade-off within health care sectors that are rivals within the same pool of resources. A priority-setting agent may then let its political objectives and social agenda rule the distribution of resources.

The rationing choice faced by health care professionals and suppliers likewise involve trade-offs but of a different nature. For one, rationing must adhere to public priority-setting guidelines and thus the rationing choice must be based on interpreting the guidelines to each individual case. Even more importantly, the priority-setting on the aggregate level is linked to the micro choices as the health care suppliers' budget constraint; the allocation of resources directly determine the extent to which supply has to be rationed.

Second, even if there are guidelines it is up to the health care professional to evaluate the importance of each criteria when choosing between two patients. Consider for instance Table 2.1 again. Imagine a medic is faced with distribution E and can choose to treat Healthy who would gain 2 health points or Ill who would gain 1. If prioritising utilitarianism, the medic will choose to treat Healthy. If more concerned with maximin severity, they will choose to treat Ill. Thus, the medic must make a rationing decision based on which ethical principle is preferred. Hence, although the macro and micro level decisions have different implications, the distribution choice in both cases come down to evaluating potential trade-offs and rankings between ethical principles or guidelines. Equally, the ethical principles dominating in the aggregate setting may be unfit for individual treatment decisions.

However, there is an inherent difficulty in incorporating the concept of equity and fairness in waiting times rationing. For waiting times to be perfectly just, individuals must have perfect knowledge about their own health status, there must be full knowledge about all care-seeking individuals so that the relative ranking is known, and individuals cannot hide, change or confound their actual health. Such a 'first-best' optimal scenario cannot be achieved without the absolute elimination of information

failures which characterises the health care market. Table 2.2 summarises the main points of the theoretical discussion.

Table 2.2: Justice theories in waiting times

Theory	**Desired outcome**	**Criteria for priority-setting**
Utilitarianism	Maximise total gain	Capacity to benefit
Egalitarianism	Equality	Equal access for equal need
Maximin	Maximise for the worst off	Severity

2.3 Economics and ethics of waiting times

Challenging utilitarian welfare

The preceding section illustrated how waiting time priorities can be set according to different ethical convictions, but also that each choice is associated with its own trade-offs. Below I expand on the discussion by comparing the standard way of analysing waiting times to the analysis implied by incorporating ethics.

Waiting times are in most literature analysed within a welfarist context as a non-price rationing tool. There has therefore been an emphasis in literature on the efficiency of waiting times in terms of maximising QALY under a given budget constraint (Zweifel et al, 2009). QALY maximisation and comparison directly reflect the utilitarian principles discussed in section 2.2.1. This is of course in accordance with the wider economic paradigm of utility-maximisation and efficiency theory.

Given these norms, egalitarianism and maximin are challenger theories to the hegemony of utilitarianism. The inertia of departing from the status quo necessitates a motivation of why these ethical principles also should be considered.

Firstly, it can be argued that economic analysis should have the ability to suggest the outcomes according to societal preferences. For example, Williams (1997) argues that the trade-offs between the traditional efficiency and equity concerns should be determined by a social welfare function. Consequently, since both the public and government care about fairness in some way or another[3], it makes sense to incorporate non-utilitarian assumptions in economic theory.

[3]E.g Nord et al. (1995) found survey results confirming that respondents care about the distribution of health with respect to fairness and equity.

Secondly, the tax-funded publicly provided health care system implies a rejection of market and thus market-oriented welfare analysis (Cullis et al,. 2000). Since welfare analysis assumes the efficient market outcome is the optimal solution, it is intrinsically at odds with health care provision. Here, egalitarianism and maximin may serve better to reflect societal preferences.

The next question is then whether to incorporate these principles into welfare analysis or abandon welfarism altogether. The benefit of the first alternative is a higher degree of comparability with prior discussion. For example, distributional weight can be attached to social outcomes as briefly stated in section 2.2.2. Staying within the welfare context may however needlessly constrain analysis; a better alternative may be to significantly alter the assumptions underlying economic theory which overturn previous work more completely.

Analytic context thus becomes a question of whether the possibly flawed accuracy of welfare analysis is preferred over the bluntness of new alternatives. This essay will not formally map the inclusion of ethics into formal analysis since it is not relevant for this essay, but there will be some reference to this issue in latter sections.

Case study: Sweden

3.1 Waiting times in Sweden

This essay now moves on from the theoretical discussion to actual waiting times. As shall be seen, it is possible to connect the justice theories to official pronouncements and objectives.

3.1.1 Policy of waiting times

The modern Swedish health care system is linked to the Nordic health care and welfare model characterised by equity and participation (Magnussen et al., 2009). This is characterised by low out-of-pockets payments, universal health insurance, and a large public sector share of health care provision (ibid.). The Swedish health care system is considered to generally provide high-quality care, however the area receiving the most critique are long waiting times (SKL, 2011). In a comparisonof twelve OECD countries, Siciliani and Hurst (2003) ranked Sweden highly in terms of the quality of medical care, but ninth regarding waiting times.

To improve the situation, Swedish decision and policy-makers have applied a broad range of policies that naturally addresses other shortcomings in the health care system simultaneously. To start with, Sweden has two opposing financial incentives for waiting times. On the one hand, health care providers providers under budgetary constraints receive some extra state transfers, while *Kömiljarden* (Queue Billion) and its successor *Samordnings- och Tillgänglighetsmiljarden* (Coordination and Access Billion) are incentive tools which monetarily rewards counties performing beyond expectations.

Importantly, there is an explicit guideline - Vårdgarantin - which sets maximum guaranteed waiting time targets for counties and hospitals. A previous attempt in 1992 failed largely because of a lack of commitment in providing resources (Hanning, 1996). Vårdgarantin guarantees that the maximum waiting time should be one day for phone contact, seven days for primary care, 90 days to receive a first visit in

specialised care, and 90 days to thence be treated in specialised care[1]. Waiting times have stabilised where on average nine out of ten meet the target, but it is unclear whether it is caused by the guarantee (Vårdanalys, 2014).

3.1.2 Ethical Platform and Priority-setting guidelines

When the ethical platform was developed in 1997, Sweden had been forced to abandon its first maximum waiting time guarantees. One cause of this was identified as the failure of policy-makers to communicate how to implement priority-setting to health practitioners (Hofmann, 2013). The ethical platform can then be interpreted as implicit guidelines, rooted in equity concerns, meant to complement the explicit guidelines of waiting time guarantees. The three principles are: The human dignity principle, the need and solidarity principle, and the cost-effectiveness principle[2]. Importantly, they are also ranked in the order written above.

The human dignity principle states that everyone has equal values and equal rights, regardless of socioeconomic characteristics or geographic position in Sweden. Additionally, the principle distances itself from discrimination based on age, as well as need due to self-harm or self-caused injury (Melin, 2007). Age and lifestyle may only be considered as factors potentially influencing the effects or side effects of treatment (Arvidsson, 2013).

The needs and solidarity principle has two components: 'Need' states that resources should be directed to those in the greatest need; that is, priority-setting based on severity of health (Arvidsson, 2013. A particular emphasis is made regarding mortality prevention and suffering (quoted by Melin, 2007). 'Solidarity' incorporates a commitment to equal opportunities of care and an effort to equalise the outcome of care (ibid.).

The connection of the cost-efficiency principle to the Statement regarding utilitarianism is clear, however it should be noted that the guidelines emphasises that cost-effectiveness should only be applied in cases when comparing two treatments with the same effect but differing costs.

The three principles can be linked to the discussion on the theories of justice in section 2.2. Starting with the human dignity principle, a clear connection can be made to Statement 2a which states that geography and characteristics should not

[1]According to Viberg et al. (2013), primary care waiting times is the time between making contact and receiving a referral, where specialised care waiting times is defined as the time between referral received and decision to treat.

[2]Common translations of människovärdeprincipen, behov- och solidaritetsprincipen, and kostnadseffektivitetsprincipen, respectively

affect access to treatment, i.e. 'equal access for equal need'. It suggests that the Swedish government ranks this form of egalitarianism as the most important one. The Swedish guidelines also distances itself from discrimination based on the cause of need on the basis that it is difficult to separate endogenous and exogenous causes of health.

The needs component of the second principle can be linked to Statement 3a; the explicit reference to mortality and suffering prevention corresponds to the severity component of maximin. Meanwhile, the solidarity component of the principle can be connected to Statement 2b; when the need is the same for two patients, the choice between them should reflect an effort to equalise health across the population.

Finally, *the cost-effectiveness principle* quite clearly connects to the welfare paradigm of utilitarianism. Statement 1b which incorporates cost has more or less the same message as the official Swedish standpoint on cost-effectiveness; Specifically, that cost minimisation should only apply to instances where all else - such as need and appropriateness - is equal.

As Melin (2007) identifies, Sweden departs from the policy in other countries such as Denmark, Norway and the Netherlands by not incorporating a benefit-dimension in the ethical platform. Such a principle would correspond to Statement 1a. Another difference with Sweden that Melin identifies is the strict ranking of the Swedish principles which can lead to unreasonable trade-offs. For instance, adhering to the principles in ranked order would neglect patients with fairly mild affections that could be effectively cured at very low cost. The main points covered in this section is summarised in Table 3.1 below.

Table 3.1: The ethical platform and justice theories

Principle	**Theory**	**Statement**
Human dignity	Egalitarianism	2a: Equal access for equal need
Needs and solidarity	Maximin	3a: Severity of need
Needs and solidarity	Egalitarianism	2b: Equality over population
Cost-effectiveness	Utilitarianism	1b: Cost-effective choice, ceteris paribus

3.2 Quantitative analysis

The aim of this section is to show to what extent relevant ethical principles are adhered to in practice in Sweden. It should be noted that the quantitative section is secondary to the theoretical discussion and meant to illustrate one application of how ethical principles can be incorporated into an interesting case study. Additionally, the ethical platform is here interpreted as guidelines for micro-level rationing within health care as opposed to aggregate decision-making.

Again, the three Swedish principles ranked are: The human dignity principle, the needs and solidarity principle, and the cost-effectiveness principles. Statements 1-3 in the preceding section identified that these correspond to the following ranking of the theories of justice: Egalitarianism, maximin and utilitarianism.

Since egalitarianism is ranked first subsequent quantitative analysis will focus on this, but this choice also reflects data availability and good surrounding literature. The egalitarian objective of 'equal access for equal need' as stated in the ethical platform and given in Statement 2a will be connected to an empirical model. Next, this main empirical model will be followed by some investigation into utilitarianism and maximin.

The focus in this section is on secondary care. There is because of two main reasons: The data available can distinguish between reasons for care while primary care treatment is bundled into one indicator. The second reason is that studies looking at equal access across socio-economic status to the health care system, find that inequality is more prominent in secondary care than in primary care (van Doorslaer et al., 2006).

3.2.1 How egalitarian are waiting times?

Egalitarianism, as identified with the Swedish 'human dignity principle' and similar statements in other countries, hold that care-seekers should have equal access for equal need. Some investigations find that this may not be the case. For example, in a study by Pell et al. (2000) set in the Scottish NHS, socioeconomically deprived patients were more likely to be in need of cardiac surgery but less likely to have heart condition investigated and operated on. Vårdanalys (2014) found that there were significant variation across regions in Sweden.

These inequalities have then been further analysed. Letting *doctor use* proxy access to health care services, Sweden has been found to be the 5th most pro-rich country in the OECD (Doorslaer et al., 2006). In the same area of analysis, Siciliani

and Verzulli (2009) uses education level as a proxy for socio-economic status, they found that individuals with higher education levels had 48% shorter waiting times than those for less educated individuals, while income interestingly had an opposite (but smaller) effect on waiting times. It is however clear that Swedish access to health care may not be fully equitable. The underlying cause of socioeconomic biases is still unclear, but could for example be due to some subconscious biases by physicians (Tingshög et al., 2014).

Data and Method

The analysis will have two parts; to investigate whether geography significantly affects waiting times and whether socio-economic status can affect waiting times. The data that was availability at the time and scope of this study were monthly county-level data in Sweden. These were collected from www.vardenisiffror.com, Socialstyrelsen and the Swedish Public Employment Service.

Because of the lack of individual level data, this study investigates whether there are significant differences between counties. This is a good level to capture geographic variation, since it is small enough to capture some differences and also the level of government which directs health care. Additionally, there is no direct access to how patients wait for care, but indicators show what percentage of meeting met the maximum waiting guarantee - which in secondary care is 90 days. The guarantee variable is denoted WT<90 in the empirical analysis. The null hypothesis of the study is hence that there will be no significant effect of which county the patient lives in on how well the maximum waiting time guarantee is fulfilled.

Data were also collected for some socio-economic characteristics, namely inhabitants that are registered as unemployed and households that receive welfare transfers as an indicator of poverty. If these have explanatory power on the capacity of health care to meet its waiting time target, it shows that waiting times are not adhering to the ethical platform guidelines.

The sample in section 3.2.1 consists of 742 observations of monthly data from January 2014 to December 2016. The sample size was constrained by the limited availability of socio-economic indicators. Hence, for the discussion in section 3.2.2 which purely analyses waiting times, the sample consist of 1491 observations where the time period lasts from April 2011 to February 2017.

The correlation between general surgery WT<90 and both socio-economic indicators is -0.07 and -0.06. The sign of the relationship is as expected but the low magnitude of correlation is slightly alarming if the socio-economic characteristics are to capture some explanatory power on the waiting time guarantee fulfilment. A

correlation power test was performed in order to see how the variables compared to the standard power 1- β - where β is the probabiliy of a type II error - of 0.8 (StataCorp, 2013). The test is based on Fisher's z test comparing two correlations (ibid.). The test shows that to achieve a power of 0.8 the sample size have to be 1600, more than twice the amount available to this study. Equivalently, the power of the econometric results under the given sample and correlations is given to be 0.37.

While the low power lends some serious criticism to the internal validity of the model specification, quantitative analysis will progress as intended but while keeping this in mind. To capture geographic variation as a determinant of access a fixed effects model is used. The county and time-fixed effects can isolate time-and-space specific trends. Given that there is some time and county variation, the model will also be less likely to fall to omitted variable bias (Kohler and Kreuter, 2009). As a result from capturing these trends in separate terms, the net effect of the predictor variable becomes more accurate (ibid.).

The fixed effects model relies on the assumption that there is some variation across time-and-space. It is therefore important to investigate whether there is indeed sufficient variation across observations for the model to be suitable. Formally, the econometric model is;

$$WT < 90_{it} = \beta_1 + \beta_2 Unemployment_{it} + \beta_3 Poverty_{it} + \alpha_i + \gamma_t + u_{it} \tag{3.1}$$

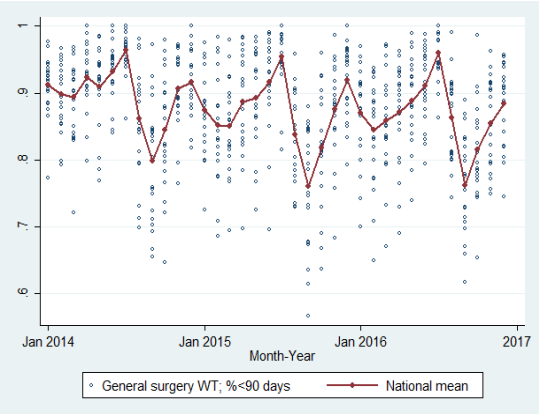
Where the subscript i denotes the cross-sectional county and t = time. $WT < 90$ is the dependent variable, which denotes the percentage of total patients which has waited less than the guaranteed 90 days. There were several options for which treatment or visit should be used as waiting times, but the waiting time between visit to specialised care and operation in general surgery was used. This is because it had one of the largest samples,and was less likely to be due to shocks in the time period considered. *Unemployment* and *Poverty* are the socio-economic covariates, α_i captures the county-specific effects, γ_t captures the time-specific effects and u_{it} is the error term.

In order to infer whether there is significant geographic variation, an F-test and Hausman Test is used. The null hypothesis for the F-test is that the county-fixed effects have no effect on WT, and the null hypothesis for the Hausman test, when comparing the fixed effects model to pooled OLS and random effects models, is that the latter models adequately capture the endogeneity caused by geographic variation.

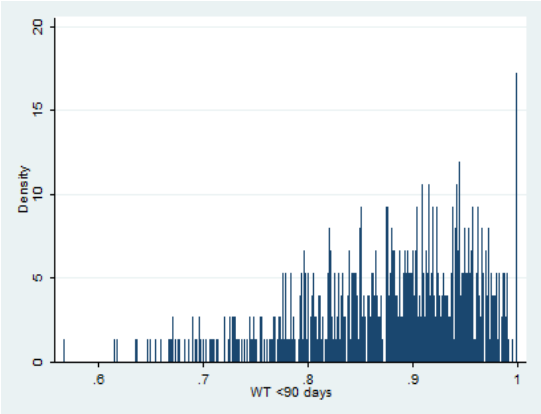
Table 3.2: Descriptive Statistics: Summary

	mean	sd	min	max
WT<90 General surgery	.876	.0801	.567	1
WT<90 Hip replacement surgery	.786	.201	0	1
WT<90 Child Psychiatric visit	.977	.065	.555	1
WT<90 Adult Psychiatric	.939	.064	.614	1
Unemployment (amount of people)	1441	1434	92	7773
Households receiving transfers	5634	6221	451	24445
N	742			

Figure 3.1: Descriptive Statistics: General surgery



(a) Scatter plot



(b) Distribution of WT<90

Descriptive statistics and regression results

Firstly, some descriptive statistics show that there is some significant variation across both time and county. A summary table of descriptive statistics can be seen in Table 3.2. Again, it confirms there is some significant variation. All four subcategories of WT<90 show that the guarantee was fully reached at some point. Looking back at the data success appears to be a slight pro-urban. There is some significant variation in both the minimum reached and the standard deviation. Both psychiatric WT<90 means are higher than for hip and general surgery.

More descriptive statistics for general surgery, as the main variable of interest, are shown in Figure 3.1. Figure 3.1a is a scatter plot over time, where the national average is the connected red line. The histogram in Figure 3.1b show the distribution of percentage of success. For the most part, a majority of patients received surgery

within 90 days, however it is rare that all patients are treated within the designated time period.

Table 3.3: Fixed effects regression

	General Surgery (%)	
Unemployment	-0.000	0.002***
	(0.00)	(0.00)
Welfare Transfers (1000s)	3.156***	0.142
	(0.55)	(0.42)
Constant	70.419***	86.911***
	(3.09)	(2.59)
Month-year FE	No	Yes
County FE	Yes	Yes
F-stat	47.25	3.53
Prob < F	0.000***	0.000***
R-Sqr	0.044	0.575
Observations	735	735
DF	712	678

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Since time-variation was confirmed both visually and in summary statistics, a fixed effects model was estimated as per Equation 3.1. The dependent variable is the WT<90 indicator for general surgery, and the explanatory variables unemployment and the poverty proxy. The results are summarised in table 3.3. The two vertical panels differ in whether time fixed effects were included or not.

As can be seen, the explanatory power of the two socioeconomic variables differ markedly depending on whether year fixed effects were included. One would expect that the larger the share of the population that is unemployed or relying on welfare transfers, the longer waiting times would be on average and the smaller the share of WT<90. However, in the instances where either explanatory variable is significant, they show a positive relationship to WT<90, implying that as either unemployment or welfare transfers increase, the tendency for the waiting time guarantee to be met increases.

The F-statistic is a joint hypothesis test where the null hypothesis states that the observed and unobserved fixed effects α_i are zero. As illustrated, the F-statistic show resounding support that the null hypothesis should be rejected and that county

fixed effects improve the model. This can be taken as evidence that geographical position does indeed affect access to health care.

Fixed effects also rely on the assumption that there is non-zero covariance between the fixed effects and explanatory variables. This can be tested with a Hausman test, which can also help to confirm if fixed effects are indeed appropriate. Regressions were consequently performed for a pooled OLS and random effects model. The Hausman test then compared the fixed effects estimation with the latter two, respectively.

The null hypothesis of the Hausman test states that individual variation in the dependent variable is adequately captured by the pooled OLS or random effects model, as compared to fixed effects. The χ^2 value for pooled OLS is 20.92 and 42.95 when comparing against the random effects model. Both tests thus reject the null hypothesis at the 1% level, and give more support to the appropriateness of the fixed effects model.

3.2.2 Maximin and Utilitarian inferences

The limited scope and data equally diminish the extent to which the application of these two ethical theories will be analysed in this essay. What will be done however, is some analysis of descriptive statistics in the light of particular Statements that could reveal interesting trends.

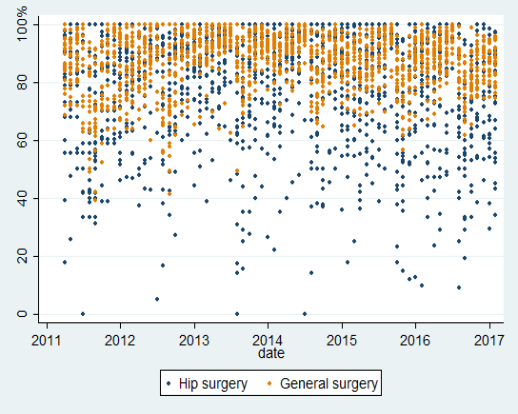
Firstly, I seek to investigate the claim that patients with more severe needs should receive higher priority. This is the needs and solidarity principle ranked second, and previously identified as corresponding to maximin justice. As captured in Statement 3a, hip or knee replacements were identified as common procedures that fit the characteristics of less severe needs and would thus be relatively deprioritised. Subsequently, WT<90 of hip replacements surgery will be compared to general surgery for Sweden 2011-2017.

Figure 3.2 summarises some characteristics which appear to confirm that hip replacement surgeries have indeed been deprioritised as compared to general surgery. The scatter plot in Figure 3.2a show that general surgery tends to be clustered above 70% of WT<90, while the variation in WT<90 of hip surgeries is larger. The latter half of the time period reveal that hip surgery have several instances below 40% of WT<90.

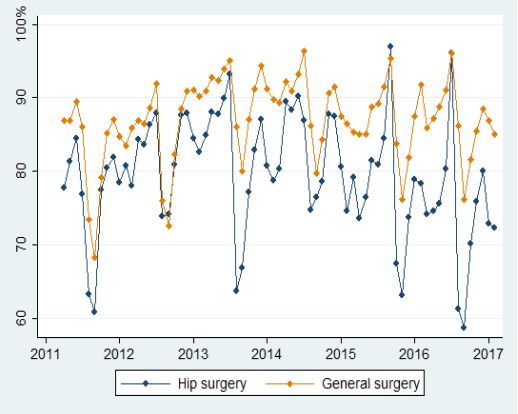
Figure 3.2b confirms the general picture given by the scatter plot. Other than one or two instances, the average waiting times were longer for hip surgery than general surgery. An interesting feature is that the time-variation, i.e. the dips and growth in the ability to meet the guarantee, happen at the same time for both variables.

Next, similar descriptive analysis is made in the utilitarian theoretical frame. The

Figure 3.2: General vs Hip Surgery



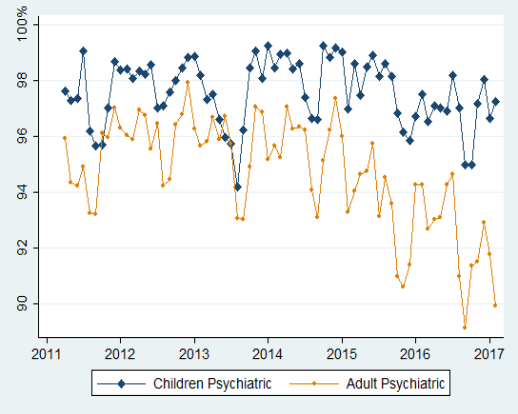
(a) Scatter plot



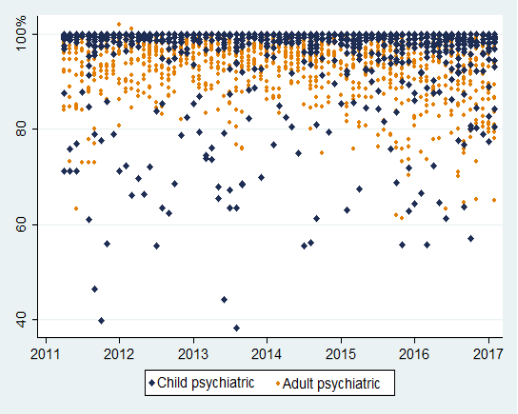
(b) Average WT<90 over time

quantity-component of QALY maximisation suggested by utilitarianism is analysed, which is captured by Statement 1a. This is because the quantity aspect of QALY's is more easily isolated than the quality aspect which relies on external QALY rankings. The WT<90 indicator of psychiatric care is compared for adults and children (<18 years old). Since the indicators is based on the same general service differing only in whether the patient group is adult or child, this should be a relatively good way of investigating Statement 1a. The expectation is that on average children should wait less than adults.

Figure 3.3: Child vs Adult Psychiatry



(a) Average WT<90 over time



(b) Scatter plot

As can be seen in Figure 3.3, the results are consistent with Statement 1a and children meet WT<90 significantly more often than adults. This holds true across the whole time period, as seen in Figure 3.3a. Of course there is some overlap in Figure 3.3b, so there is a clear trend but treatment is not *unilaterally* faster for

children. These descriptive characteristics are thus on the whole consistent with the the expectations from the utilitarian 'capacity to benefit' perspective.

The results rest on the assumption that on average the severity of psychiatric need is equal for adults and children. Still, the descriptive characteristics of the data convincingly communicate that it cannot be ruled out that priority-setting incorporate some consideration of capacity to benefit. As discussed in the previous section, this is in contrast with the official guidelines in Sweden.

3.2.3 Analysis of results

Egalitarianism and the fixed effects model

The preceding sections analysed the three principles of justice in the order which they were ranked by the Swedish ethical guidelines. It was found that in the case of egalitarianism, ranked first in the Swedish ethical platform, the empirical model could not confirm that waiting times reflected equal access for equal need. The fixed effects estimation appear to show that geographical variation does matter in the delivery of WT<90. Neither was the effect of some socio-economic indicators completely confirmed to have zero effect on waiting times. Year-fixed effects also improve the model, which is expected from the visually depicted time trends.

The main limitation of these results originates from issues concerning the data which consequently affect the strength of the model. Firstly, the sample of indicators was suboptimal and resulted in low econometric power of statistical inferences. Ideally, a natural experiment where one could isolate the effect of geographic location and/or socio-economic characteristics would have led to the most robust results. A significant improvement may also have been achieved by a larger sample. However, the data used in this essay were county-level aggregates which could hide important intra-county variation. Additionally, the sample of 742 observations may also be smaller than desired.

Secondly, the socio-economic indicators have a flawed link to waiting times which may explain why the result did not concur with the expectation, again as captured by the low power of the test. For example, it was found that more households receiving welfare transfers significantly affected the ability of counties to meet their guarantee positively. Literature however suggests that low income-takers may be subject to negative discrimination, where welfare transfers were meant to capture the frequency of low income taking households. An alternative explanation may be that a higher degree of welfare transfers suggest a higher degree of solidarity in the county-government, which may be more concerned with meeting the waiting time

guarantee fairly. The low correlation could be explained by the indirect measurement of waiting times, or the fact that waiting times are co-determined by a multitude of factors not included in the data.

If it is established that there is no negative relationship between unemployment rate and waiting times, and that expected theory stands, the statistical power could improve by limiting the hypothesis test to a one-tailed test. However, the main obstacle to a wholesome improvement are restrictions to data availability as it is; hence, other case studies could be considered in the future.

Descriptive statistics with maximin and utilitarianism

The extent to which the maximin principle was adhered to was tested via Statement 2a which concerned priority of more severe needs. The descriptive statistics appear to confirm that severity does affect the share of care-seekers receiving care within the waiting time guarantee. With hip replacements proxying a less severe need than general surgery, it was found that hip replacement surgery more frequently failed to meet the guarantee.

The validity of these conclusions is challenged by the superficial level of analysis which was constrained to descriptive statistics. There are many underlying factors that could affect the results which this essay did not attempt to investigate. Additionally, an implicit assumption was also made regarding general surgery as an indicator reflecting more severe needs than hip replacements, but by definition surgeries within this category include a wide range of interventions. Nonetheless, it is not completely unrealistic to assume that on average, hip replacements reflect less severe needs.

Lastly, the same method of descriptive analysis was applied to a 'capacity to benefit' perspective encompassed by the utilitarian Statement 1a. Again, the results are consistent with the expectation that younger persons with the same need are prioritised ahead of older persons: Children psychiatric visits were consistently more likely to be met than adult psychiatric needs.

Naturally, the same criticisms about the superficiality of analysis applies here. While these results have not been confirmed with more sophisticated tools, they reveal several interesting properties and a way of empirically analysing ethical priority-setting choices in waiting times.

Discussion

4.1 Findings and Limitations

Validity of results

There were essentially three steps taken to meet the objectives of this essay. It encompassed a wider theoretical discussion which delved into the application of fairness and ethical principles to waiting times. Statements were created that connected theories of justice to explicit priority-setting of treatments. Next, these Statements were paired with the Swedish ethical platform to finally allow quantitative analysis.

Formulating the Statements was relatively straightforward once the theories of justice as applied to waiting times were unpacked. The most difficult issue was to substantialise priorities with explicit reference to different diseases. In particular the Statements related to maximin which involved severity of disease (and hence required explicit reference to some disease groups) provided a challenge. However, the examples are grounded in other examples in literature and should hold true nonetheless.

Connecting the Statements to Sweden's guidelines found one surprising finding; the rejection of capacity to benefit as a means of prioritising care, which related to a utilitarian ethic. It made the quantitative investigation of Statement 1a all the more interesting, since it confirms its existence in terms of prioritising children's need ahead of adults. This goes strictly against the no-ageism statements. It is possible that the pronouncement aimed to restrict discrimination between adults, but the results are still interesting.

A benefit of the essay's structure is that the Statements could be tested against any national backdrop. However, the results lack validity on several fronts. Stronger internal validity could be reached with access to better quality data, in particular regarding socio-economic indicators. While the fixed-effects model was a good choice, more robustness checks would further validate the results. These were neglected

primarily because of lack of scope. Additionally, the indirect measure of waiting times could confound results since the WT<90 indicator may hide significant variations in actual waiting times.

Similarly, the conclusions from the result are based on assumptions that were not formally evaluated. For example, the investigation comparing child and adult psychiatry implicitly assumes that psychiatric need is equal for children and adults. However, psychiatric health shocks in childhood are often considered to have a more negative impact than those incurred as an adult. Such a problem may be overcome with data where two age-groups are compared over the childhood break-off point, i.e. comparing access for 17 and 18-year-olds. Again, improvements rests on new data.

In addition, the results for the maximin and utilitarian results could be misleading. For instance, the comparison between hip surgery and general surgery could be based not on severity. Instead there could be a hidden bias against age, since the average age of patients seeking hip replacements tends to be higher than general surgery. Hence, while the results are consistent with the ethical platform from the point of view of severity, the motives behind the results are unknown.

Future extensions of results

As implied by the above, a better measurement of the fairness of waiting times demands a better connection between theory and real waiting times. One way is to build on the empirical analysis employed here, either by waiting for more data in the case of Sweden, or look to other case studies. Inferences could also be qualitative, to examine issues such as physician preference and priority-setting behaviour.

A departure from the focus of this essay would be to test the causal effect the presence of explicit or implicit priority-setting guidelines have on actual waiting times. An identification strategy is thus necessary to isolate the effect of the presence of guidelines. For example, a comparison of waiting times before and after the ethical platform was introduced in Sweden in 1993 could yield interesting results.

In terms of the theoretical discussion, analysis could go both wider and deeper. The discussion could be extended to incorporate more theories of distributive justice, and in this way capture more façets of priority-setting foundations. Deeper and more complex analysis could formalise the incorporation of the theories of justice into a utility setting or an agents-based approach (such as Rebba and Rizzi, 2011). A formal mathematical model would both facilitate precise analysis of the dynamics of waiting times while also improving the comparison to past waiting time analysis using such a framework.

4.2 Wider implications

Because of the twofold approach in this essay, there are two groups of implications. The first relates to the general case of incorporating ethics into health care waiting times, and the second when applying and analysing these principles for Sweden.

The theoretical discussion revealed the theories of justice have important implications for the analysis of waiting ties. Traditionally, analysis of waiting times cannot escape the utilitarian worldview underpinning welfarist analysis. However, this essay has shown that it is necessary to incorporate both egalitarian and maximin principles in order to accurately analyse waiting times as the 'fairness' rationing tool it is. Indeed, there is a mismatch between purely analysing the net benefits of waiting times when its function is to depart from market-dependent outcomes. The theories can for example be incorporated into welfare analysis by letting utility functions depend positively on the characteristics of distribution valued by the two theories, or by incorporating distributional weights in normative analysis.

Furthermore, the theoretical discussion more broadly illustrates that economic analysis can benefit from incorporating elements of political and philosophical thought. This method of analysis is consistent with a general trend of merging disciplines to generate new insights.

This essay also demonstrates implications for how the fairness of waiting times is understood in the specific case of Sweden. Firstly, by pairing the ethical platform components explicitly to well-understood theories of distributive justice, the priorities of the Swedish government were clarified. The ethical platform can consequently be more easily compared to both a general discussion on fairness in policy and health care, but also to facilitate cross-country comparisons.

Secondly, the quantitative section gives insights into the current state of waiting times in Sweden, in the context of the maximum waiting time guarantee. A better understanding is needed to know how the ethical platform applies to health care suppliers' rationing decisions.

Conclusion

In the beginning of this essay three objectives were listed. The first objective was to generate discussion on the use of waiting times in health care and question assumption in its analysis. It was found that the standard welfare analysis does not capture the complexity of fairness objectives and that analysis indeed misrepresents the trade-offs of non-utilitarian paradigms since the underlying method itself is utilitarian. For one, utilitarian analysis fails to appreciate the extent of which a more equitable distribution of waiting times is preferred to an efficient distribution. Subsequently, this essay suggested that economic theory amend base assumptions to allow for more egalitarian preferences as suggested by public policy.

This conclusion quite naturally led to the second objective, which was to explicitly link priority-setting in waiting times to three ethical principles: Utilitarianism, egalitarianism and maximin. Six Statements were formed to capture key features of waiting times as according to each theory. These were connected to rationing according to equal rights, severity, capacity to benefit and cost-effectiveness.

The final objective was to apply the theoretical concepts developed to the context of Sweden's ethical platform. Quantitative analysis tested the validity of three of the six Statements (one for each theory of justice) using data on how well the maximum waiting time guarantee had been fulfilled. The results illustrate that waiting time priorities do not adhere to the official guidelines in terms of egalitarian 'equal access for equal need'. The results are, however, consistent with guidelines in the case of prioritising severity of needs.

This essay has shown that the inclusion of ethical principles in the analysis of health care is beneficial both from a theoretical point of view as well as an empirical. The results shed light on the difficulty in setting priority-setting guidelines to be consistent with fairness, whatever the public or government definition of fairness may be. Future research can build on both the theoretical and empirical part of this essay, which would enable decision- and policy-makers to better understand and design guidelines ruling rationing decisions of waiting times.

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Appendix

List of Statements listed in section 2.2

Utilitarian:

Statement 1a: *Utilitarianism suggests that waiting times should reflect the capacity to benefit and maximise the actual change in health. The most straightforward metric is that, all else being equal, a younger person should be prioritised ahead of an older person.*

Statement 1b: *Utilitarianism suggests that all other things being equal, the treatment with the least costs per gain in QALY - or equally the treatment maximising QALY per monetary unit - should be chosen.*

Egalitarian:

Statement 2a: *Egalitarianism in terms of 'equal access for equal need' suggests that waiting times should be the same for individuals applying for the same treatments and not depend on geographic position or socio-economic status of the care seeker.*

Statement 2b: *Egalitarianism suggests that when a treatment with the same cost will lead to the same health gain for two individuals, priority should be given to the individual who after the treatment will be closest to average health.*

Maximin:

Statement 3a: *Maximin suggests that waiting times should reflect the severity of the disease, and in particular the severity if left untreated. Hence, care-seekers with great mortality risk or suffering should expect shorter waiting times. This means treatments such as hip or knee replacements should be deprioritised in favour of for example palliative, cardiac and cancer patient care*

Statement 3b: *Maximin suggests that pregnancy and maternity care should have shorter waiting than those with otherwise equal health gains, since the gains in health should count both mother and the child.*