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Equity in health care delivery and finance

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"Equity in health care delivery and finance* "

by

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1. Egalitarianism and responsibility

Much has happened in the theory of distributive justice during the last 30 years, in the period, roughly, since Rawls published his magisterial work¹. As occurs in most fields following a great contribution, that work has been subjected to critique, amended and ramified, so that what Rawls proposed now appears as an early ancestor of contemporary theories of distributive justice, or equity. In this paper, I locate what I think is the main trend in this developing theory, and then to try to apply the theory to the issue of health.

To come quickly to the point, what's largely missing in Rawls's theory of egalitarianism is an adequate formulation of the role of responsibility. Rawls did try to integrate responsibility into this theory, as I shall describe. But, seen from the developments of equity theory since Rawls, his effort was only a first groping, and did not fully come to grips with the issue.

In arguing for equality, Rawls did not advocate the equality of degrees of welfare or happiness of people, but rather of an *input* into those welfares, what he called primary social goods. In so doing, he held individuals responsible for their life plans, in the following sense: someone who constructs a life-plan requiring great wealth would not receive, at the bar of Rawlsian justice, more resources than someone who constructs a more modest plan

* I am grateful to Milton and Ruth Roemer, and to G.A. Cohen and Joaquim Silvestre, for their comments on an earlier draft.

¹ John Rawls, *A Theory of Justice*, Harvard University Press, 1971

in respect of resource use. In this sense, individuals, in the Rawlsian theory, are held responsible for their own 'expensive tastes;' society, that is, does not compensate them with more resources should they develop plans of life which are more resource intensive than the average. Rawls deems it sufficient to equalize certain inputs into welfare, primary goods.

To put it another way, using the Rawlsian terminology: distributive justice requires compensating persons only for the disadvantages they suffer due to factors in their environment which are morally arbitrary. But Rawls did not hold that a person's life plan was morally arbitrary, in the sense that being born in Calcutta, or Beverly Hills, is morally arbitrary. To have declared that equity required equalizing levels of happiness, where Rawls defines happiness -- I think correctly -- as the extent to which one's life plan is realized, would have been to insure people against having chosen ambitious life plans, in the sense that egalitarians *do* think that a person should be insured against the bad luck of the birth lottery (e.g., being born handicapped, or to a homeless family in Calcutta). And why did Rawls not declare life plans to be morally arbitrary? Because if a person's life plan were morally arbitrary, what about him would not be? And if everything about a person were morally arbitrary, what grounds would we have for holding him responsible for any aspect of his behavior or existence, indeed for viewing him as directing his own life?

In 1981, Ronald Dworkin wrote two essays that focussed upon the issue of responsibility in the theory of distributive justice.² Dworkin asked, exactly what is it that egalitarians should seek to equalize? He was animated by examples in which people developed expensive tastes, or preferences for styles of life, which required large resource endowments. He distinguished between a person's resources, or endowments, and his ambitions. Dworkin proposed that the right things to equalize were the resource bundles of persons, where resources include not just tangible wealth, but the less tangible handicaps

² Ronald Dworkin, "What is equality? Part 1: Equality of Welfare," *Philosophy and Public Affairs* 10, 1981:185-246, and "What is equality? Part 2: Equality of resources," *Philosophy and Public Affairs* 10, 1981:283-345

and talents that people have. An ethically attractive egalitarianism, however, would not seek to equalize welfare, or, more precisely, to compensate people for the personal states resulting from their having differential tastes or ambitions. It is, however, not obvious how to *equalize* a bundle of characteristics (resources) across persons, when some elements of the bundle cannot be changed (e.g., inborn handicaps and talents). The question for Dworkin was: How does one properly compensate a person for the unfortunate bundle of inalienable resources she may have, with a transfer of alienable resources, like money? Dworkin offered a proposal, which was not unproblematical, and which my space constraint prevents me from describing here. Suffice to say, in Dworkin's proposal, a person was made to bear the costs of his ambitions.

In 1989, another philosopher, Richard Arneson, published a new proposal, building on both Rawls and Dworkin.³ Arneson said that Rawls and Dworkin had sought to integrate responsibility into the theory of egalitarianism by equalizing some *input* into a person's welfare or happiness -- either primary goods or resources, comprehensively defined in the Dworkinian manner. In contrast, Arneson proposed not to equalize some input, but to move from outcomes to opportunities. Rather than equalize outcomes (in this case, welfare or happiness levels), and rather than equalize some list of inputs useful for achieving outcomes, one should equalize *opportunities* for achieving the outcome in question.

Now one might say that opportunities for successful life-plan achievement are equalized by equalizing Rawlsian primary goods or Dworkinian resources, but Arneson argued against that claim. The idea of equal opportunity is that all people should face sets of choices which are, in some sense, equivalent, and this, he said, is not captured by equalizing some list of inputs into welfare. When personal choice sets have thus been

³ Richard Arneson, "Equality of opportunity for welfare," *Philosophical Studies* 56, 1989:77-93

equalized, the different outcomes which result from individuals' making different choices from those equivalent sets are of no ethical concern. Of course, one has to be careful in deciding when those personal sets of choices are equivalent. It wouldn't be adequate to say, for instance, that everyone faces the same set of choices if there is no discrimination in hiring and public education is available to all. We all know that that kind of formal equivalence does not make the choices people face *de facto* the same, should they come from very different socio-economic backgrounds. Arneson attempted to deal with this problem and others.

The notion of equal opportunity is often defined metaphorically by reference to leveling the playing field. What are the troughs in the playing field of life that should be leveled or filled in? They are, I propose, the effects of disadvantageous circumstances beyond the individual's control on his pursuit of welfare or well-being or life-plan realization or self-realization. Equal opportunity, I assert, requires that the effects of these circumstances be neutralized, so that the outcome a person eventually achieves is due only to his *effort* or *autonomous choices*, where autonomous choice is taken to circumscribe those aspects of a person's behavior which are *not* determined by circumstance. Outcomes may justifiably differ, if they are due only to differential effort or choice, but not if they are due to differential circumstance.

To illustrate these ideas, I will next present an example. I will then distill the key theoretical concepts from the example. Finally, I will attempt to use these concepts to formulate, at least roughly, the problem of equal opportunity for health.

2. Equal opportunity for future earning power: an example⁴

⁴ The theory of equal opportunity I expound below is fully developed in my *Equality of Opportunity*, Harvard University Press (1998).

I shall describe how to formulate a policy which equalizes opportunities, in a population of youth, for future earning power. To do so, I need to specify exactly what the *objective* is, what constitute the relevant *circumstances*, how to measure the relevant *effort*, and what *instrument* shall be used to carry out the opportunity equalization. Our goal will be as follows: To equalize, by use of the instrument, opportunities for acquiring the objective, in the sense that the degree of the objective acquired shall be sensitive only to a person's effort and not to his circumstances.

The objective is, let us say, the wage or salary a person will be capable of earning at some adult age, perhaps thirty. I shall take the instrument to be education or, more precisely, the amount of money that is spent in the public educational system on individuals. The circumstances are those aspects of a person's situation which are beyond his control and influence his achievement of adult earning power.

How might we choose these circumstances, if we were actually going to do carry out this computation? I would propose that we choose such characteristics as the socio-economic status of the person's family, the level of education of his or her parents, the person's race and sex, and perhaps some measure of the person's learning capacity, such as IQ. (We need not be concerned with the social determinants of IQ: they are, in any case, also characteristics beyond the person's control, and so if IQ is in part determined by them, that works in the right direction for us in this instance.) We then partition the population in question -- the society's young people -- into what I call *types*, where a type consists of all persons with the same vector or list of circumstances.

How should we measure effort, the autonomous part of behavior? Well, we might choose something like the number of years of school the individual attended. Clearly, there is an element of social determination of this variable -- that is, the frequency distributions of years of school attended will vary by type. What we need to do is to factor out this social determinant, so that we have a cleaner measure of *autonomous* choice. I propose to do this as follows.

The frequency distributions of school years attended, will, as I said, differ across types. More fortunate types will have 'better' distributions. Now the frequency distribution of years of school attended is a characteristic *of the type*, not of any individual. Thus, a person should not suffer, in the final analysis, from being in a type with a bad distribution of effort. We need some inter-type comparable measure of effort which factors out, so to speak, the goodness or badness of distribution itself. I propose that such a measure of effort is the centile in the distribution of school years completed of his type at which the individual sits.

To explain this choice, notice that, by definition, all individuals in a type have the same circumstances. Hence, if some in the type have worked hard and some not, that must be due to autonomous volition⁵. We can say that a person in type A has tried harder than another person in type A if the former attended 12 years of school, and the latter eight. But we cannot say that a white upper-middle class child in the US who attended school for twelve years has tried harder than a black working-class child who attended school for eight years: for doing so would not take into account the circumstantial determination of the different *distributions* of school attendance in the two types. Indeed, if the white and black children just referred to each were at the 60% centile of the distribution of school attendance in their respective types, I would say that they had each expended the same *degree* of effort. (Thus, I distinguish between *levels* [absolute number of years of school attended] and *degrees* of effort.) The idea here is to calibrate a person's degree effort by comparing his effort to others with his circumstances.

I next must describe what, precisely, it means to *equalize* the opportunities for the objective in question. This is the only tricky part to do without mathematical notation, but I will try my best to present the basic idea in an accessible form. I say that opportunities have

⁵ It could, as well, be due to other circumstances, not named in our list. I shall, however, assume that the list has captured the most important circumstances, and hence attribute the variance in effort within the type to autonomous volition.

been equalized when, at each centile of effort, the earning power, in the future, of all persons *across types* is (as close as possible to being) equal. Thus, at the sixtieth centile of the effort distributions, all individuals, regardless of their type, end up earning (approximately) the same wage⁶. Moreover, this must hold at *all centiles*. It will be the case that those persons at higher centiles of effort will earn more on average than those at lower centiles, but it will not be the case that two individuals at the same centile of their effort distributions, but with different circumstances, earn different wages. There is a way of formulating a single objective, which when maximized, delivers a fairly good approximation to this ideal⁷. (The ideal, in fact, is mathematically unachievable, so we must resort to what's called second-best analysis.)

Now you can challenge this proposal in a variety of ways -- having to do with the concept itself, with the particular formulation of the various key terms (circumstances, effort, instrument, objective), or in regard to the availability of suitable data to carry out the project. Before considering some challenges, let me review the qualitative nature of the solution to the problem. We would begin with a total educational budget for the society, and I would take the instrument as the distribution of this budget among the different types. In principle, I would wish to be able to distribute the budget in any way among the types. The problem is to find that distribution of the budget that best fulfills the goal I've described. It's important to understand that there is, given the data, exactly one solution to this problem. There will be no ambiguity in what constitutes the opportunity-equalizing distribution of the budget, once the terms of the problem are precisely specified. The qualitative nature of the

⁶ Actually, this should be weakened as follows. It should be the case that the average wage earned by those at a given centile of effort is independent of type.

⁷ The exact formula is presented in Chapter 4 of J. Roemer, *Equality of Opportunity* .

solution will be to spend more of the budget on disadvantaged types, but not to try to equalize wages achieved across effort differentials *within* types.

On to some challenges, then. One might say that IQ, or a perfect measure of inborn intellectual capacity, if we had one, should not be included in the list of circumstances, because it would be terribly wasteful to spend a lot of resources trying to bring the wages of innately untalented people up to wages of innately talented people. My response: This is not a challenge to the *concept* I have put forth of equal opportunity; it is rather, an assertion that we should not try fully to equalize opportunities, because society has other values, as well. More generally, it is not obvious that society will or even should want fully to equalize opportunities -- the cost in terms of the size of the national output, what's usually called efficiency, may be too great. A second challenge: If, in type A, Jill has attended 12 years of school and Jack only eight, it's not obvious that Jill tried harder. Maybe she had a mother who spent more time with her than Jack's did, and that's a circumstance, not taken into account by the proposed definition of type. My response: Of course, we cannot capture, in the list of circumstances, everything beyond a person's control which influences the outcome she achieves. Here, we are trying to formulate a social policy, which applies to millions of people. We can only proceed by making a list of the most important and measurable circumstances. Third challenge: If you delve deeply enough, everything a person does is determined by circumstances beyond his control -- genes, pathways of synaptic connections, details of family life, etc. Hence, circumstance is everything, effort nothing. My response: Indeed, the logic of this challenge is that we should equalize *outcomes*, in this case, wages, for all. As you can see, this challenge gets into the issue of free will. I cannot do justice to it here, but shall simply remark that every society has conceptions of personal responsibility, whatever may be the metaphysical truth about free will: it will wish to draw the line somewhere, and hold people responsible for their actions above that line, so to speak. In the algorithm I've been describing, that line is drawn once the list of circumstances has been delineated.

Let me give you a rough idea of what this theory produces in an actual application. With my collaborator Julian Betts, a labor economist at UC San Diego, I have computed exactly what the distribution of the US education budget would have to be in order to equalize opportunities for future earning power among American youth, where we take only *one* characteristic to comprise circumstance, the socio-economic status of the family the child comes from⁸. We capture this status as the level of education of the more highly educated parent. We partitioned the universe of young men who comprise our sample into four types; the most disadvantaged type grew up in families whose more highly educated parent had less than nine years of schooling; the next type had parents who had more than nine but fewer than twelve years; the next type had a parent who graduated from high school only; and the most advantaged type had a parent with some tertiary education. We used a longitudinal data set, the National Longitudinal Study of Young Men (NLSYM), which has tracked a group of young men for over thirty years. Thus, it provides information on their parents, on how much was spent per capita in the school district they attended, and on their wages as young men. From these data, we can compute the elasticity of future wages with respect to educational investment, by type of child. It turns out that, given an educational budget of \$2500 per capita, the equal-opportunity allocation of spending is given by Table 1, in which x_i is the per capita educational expenditure on children of type i .

Table 1 EOp solutions, Typology = { E_1, E_2, E_3, E_4 }

E_1 = parental education less than eight years

E_2 = $8 <$ parental education < 12

E_3 = parental education = 12

E_4 = parental education > 12

r	x_{E1}	x_{E2}	x_{E3}	x_{E4}	wEOp/wER
\$2,500	\$4,770	\$3,030	\$2,200	\$530	1.024

⁸ I summarize below from J. Betts and J.E. Roemer, "Equalizing opportunities through educational finance reform," UC Davis Dept of Economics Working Paper, 1999.

Table 1 says that we would have to spend about nine times as much per capita on the education of the least advantaged type as on the education of the most advantaged type to equalize opportunities for the acquisition of wage-earning capacity. The last column of the table says that, were spending to be allocated in this way, average wages would *increase* by 2.4%, compared to what they would be if the same amount (\$2500) were spent on all children. This is perhaps a surprise.

Once we have computed the equal-opportunity policy, we must consider what is conceptually a completely different issue, but from the viewpoint of the policy maker is equally important, namely: Is the equal-opportunity policy politically feasible, would it be a stable policy in the society in question? To take the example just given, it would not, at this point, be politically feasible in the United States to allocated spending as Table 1 recommends. The US polity would probably eliminate public education, were that policy instituted. It is important to distinguish between what policy is desirable, from the Eop viewpoint, and what policies are politically feasible. In my view, it is useful to separate these two exercises: first, to calculate the desirable policy, and then to consider how best to approximate it, in the domain of politically feasible policies.

3. Applying the theory to health: Part 1, the delivery of health care

It is not completely straightforward to apply the theory of equal opportunity to health care: we have a great deal of latitude in choosing the objective, the circumstances, the measure of effort or autonomous choice, and the instrument(s). Space, and my limited knowledge of medical care issues, prevent me from a full discussion of the alternatives; I shall attempt to outline only two proposals.

These correspond to two different problems one can address. The first is, how should health care be allocated and delivered in a population, once the budget exists? This problem does not concern itself with the allocation of the costs of delivering health care to the population. The second problem is, how should the costs of medical care be incident on

the population, *and* how should the care be allocated and delivered? Clearly, the second problem is more complete, and complex. I will begin, in this section, by addressing the first problem; that is, I assume that the budget exists, and financing is not an issue. In the next section, I will address the second problem.

What is the *objective* opportunities for which should be equalized? This in itself is a hard problem, but one I cannot focus upon here. I propose that we equalize opportunities for quality-adjusted years of life (QALYs). I do not wish to debate the relative merits of QALYs, DALYs, and other possible measures of good health status. The reader may substitute her favorite such measure here for QALYs.

What are the relevant circumstances? Practicality requires that we choose a short list of circumstances. For a start, we could partition the population into types, based upon their education and occupation, for example. If we do so, then we are saying that we want to equalize QALYs across these socio-economic types, at given degrees of 'effort.' This raises an important point. Earlier, I said that circumstances should be aspects of the person's environment that influence the outcome in question, and that are beyond his control, *or* that we wish not to hold him accountable for. The education and occupation of a person are consequences both of things beyond his control, and of choices that he has made that we may wish to view as autonomous. So I justify defining circumstances as education-occupation status here not because a person's education and occupation are beyond his control, but rather because I propose that we do not want to hold a person accountable for the effect on his eventual health (QALYs) of his education and occupational choices. This is an ethical view that one could challenge.

What is the effort variable? I think it is life-style quality, the choices individuals make that effect their health status: whether or not they smoke, the fat content of their diet, their sexual behavior, etc. Clearly, within each type -- that is, each cohort as defined by the education- occupation vector -- there will be a distribution of good and bad life-styles, with these adjectives not implying any moral judgment, but simply, their consequences for health.

Recall, from the education example, that we will be concerned with the distributions of effort, here life-style quality, in each type. To the extent that these distributions differ across types, individuals within them will not be held responsible.

What is the instrument? Here, there is much room for choice, and the attractiveness of the policy we eventually recommend may well depend on that choice. I propose that the instrument be a vector of expenditures on disease occurrences: that is, a vector (x_1, \dots, x_n) , where society will spend x_i on treatment of an occurrence of disease i in an individual.

This defines completely the parameters of the problem. The key data that are needed to calculate the EOp policy are the frequencies of disease occurrence *by type* in the population, and the effect on QALYs of spending given amounts on treatments of given diseases. The task is to find the vector of disease expenditures, which is feasible given the budget and the type-incidence of diseases in the population, that maximizes our equal-opportunity objective.

This instrument will only be effective in equalizing opportunities for QALYs if the frequencies of the major disease categories differ across types. Let us take a very simple example. Suppose there are two types, poor and rich, and two diseases, tuberculosis and cancer. The poor contract (and die) mainly (of) tuberculosis and the rich, mainly (of) cancer. The rich, at present, have a much greater number of QALYs at each centile of the effort distribution. The EOp policy will be to spend a lot on tuberculosis and little on cancer. Clearly, if the relative frequency of the two diseases were the same in the two types, this instrument would not permit us to equalize opportunities for QALYs in the population. In that case, we would have to choose another instrument, such as the amount to be spent on the occurrence of an episode of a disease *by type*.

Before commenting more specifically on the EOp solution, let me note that this proposal implements the policy of Health for All, advocated by WHO. In describing the concept of equity upon which that policy is based, Margaret Whitehead writes that the results of 'health-damaging behavior if freely chosen, such as participation in certain sports

and pastimes,' should not be considered to constitute an inequity⁹. This is exactly my thesis about the role of autonomous volition's effect on health status. She further elaborates:

Judgments on which situations are unfair will vary from place to place and from time to time, but one widely used criterion is the degree of *choice* involved. Where people have little or no choice of living and working conditions, the resulting health differences are more likely to be considered unjust than those resulting from health risks that were chosen voluntarily. [Emphasis in original]

And, using our terminology, Whitehead states:

Equity is therefore concerned with creating equal *opportunities* for health, and with bringing health differentials down to the lowest possible level. [Emphasis in original]

Now Whitehead, and WHO, have chosen a relatively uncontentious example -- namely, dangerous sport -- to illustrate the point about autonomous volition. But exactly the same reasoning applies to harder examples, like smoking and lung cancer. *If* we decide that a person has 'freely chosen' to smoke, then that person is not presumed, under our theory, to have the same rights with respect to public compensation for the treatment of his ensuing disease as one who acquires lung cancer while having chosen to live healthily. And how do we decide how responsible a person is for his smoking behavior (unhealthful life style)? By seeing at what centile of the life-style quality frequency distribution of his type he sits. (I am here thinking of health policy in an advanced industrial society, where the effects of smoking are popularly known. It would not be appropriate to hold people responsible for an unhealthful behavior if they cannot be expected to know that it *is* unhealthful.) Thus, a person will not be held responsible for smoking, if smoking is ubiquitous among his type. Coal miners, if smoking is prevalent among them, would not be held responsible for that unhealthful behavior, while a smoking college professor, most of whose occupational co-workers do not smoke, would be.

⁹ Margaret Whitehead, "The concepts and principles of equity and health," *International Journal of Health Services* 22, 1992, 429-45.

I shall next illustrate the EOp solution by constructing a specific example of the tuberculosis-cancer story. The poor have life-styles whose qualities are uniformly distributed on the interval $[0,1]$, while the rich have life-style qualities that are uniformly distributed on the interval $[0.5, 1.5]$. The probability of contracting the disease, as a function of life-style quality (e)

$$c(e) = 1 - 2e/3 \text{ for both types,}$$

$$e = 1 - e/3 \text{ for the poor.}$$

(The rich do not contract tuberculosis at all.

Suppose that life expectancy for a rich individual is given by

$$70 \quad \text{if cancer is not contracted,}$$

$$\text{and } 60 + 10 \frac{x_c - 1}{x_c + 1} \text{ if cancer is contracted, and } x_c \text{ is spent on its treatment.}$$

Thus, if the disease is contracted, life expectancy will lie between 50 and 70, depending on how much is spent on treatment (from zero to an infinite amount). (This is a simple of modeling the fact that no body dies of cancer before age 50.)

Suppose that life expectancy for a poor individual is

$$70 \text{ if neither disease is contracted,}$$

$$60 + 10 \frac{x_c - 1}{x_c + 1} \text{ if cancer is contracted and } x_c \text{ is spent on its treatment,}$$

$$\text{and } 50 + 20 \frac{.1x_t - 1}{.1x_t + 1} \text{ if tuberculosis is contracted and } x_t \text{ is spent on its treatment.}$$

Thus, the poor can die at age 30 if they contract TB and nothing it is not treated. With large expenditures, a person who contracts TB can live to age 70. Furthermore, it is expensive to raise life expectancy above 30 if TB is contracted . I further assume that if a poor person contracts both cancer and TB then her life expectancy will be the minimum of the the above two numbers.

Finally, I assume that 25% of the population is poor and 75% are rich, and that the national health budget is \$3000 per capita.

With these data, one can compute that 33% of the rich will contract cancer, 9.3% of the poor will contract only cancer, 26% of the poor will contract only TB, and 57% of the poor will contract both TB and cancer.

Our instrument is (x_c, x_t) , the schedule of how much will spent on treating an occurrence of each disease. The objective is to equalize opportunities, for the rich and the poor, for life expectancy.

The calculation of the optimal solution is presented in the Appendix. The solution is $x_c = \$250$, $x_t = \$13,900$. In Figure 1, I present the life expectancies of the rich and the poor, as a function of the percentile at which they sit on the effort distribution of their type, at this solution.

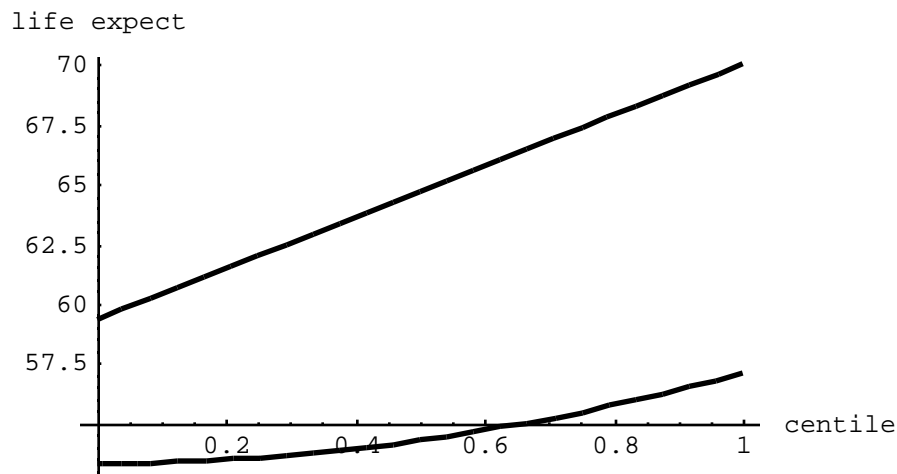


Figure 1

We see that, at the EOp solution, the rich still have substantially greater life expectancy than the poor – despite the large amounts being spent on treating tuberculosis. Moreover, life expectancy increases significantly with life-style quality – this is an aspect that EOp does not attempt to eliminate.

Let us compare this solution to the *utilitarian* solution, which is the expenditure schedule at which (average) life expectancy in the population as a whole is maximized. The

solution turns out to be $x_c = \$2520$, $x_t = \$9,350$. Ten times as much as spent on cancer as in the EOp solutio. Figure 2 graphs the life expectancy of the two types in the utilitarian solution (light lines) as well as the EOp solution (heavy lines):

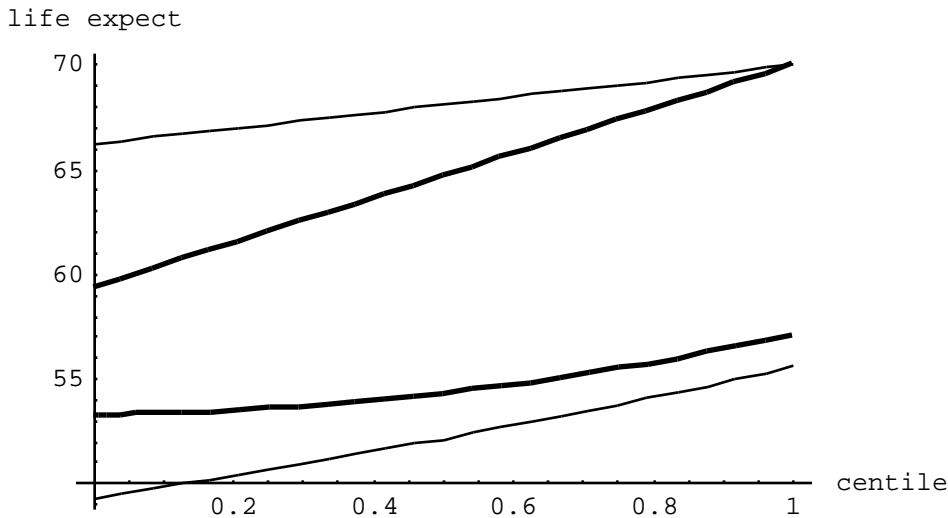


Figure 2

We see that the utilitarian solution narrows the life-expectancy differential between the types a good deal less than does the EOp solution.

It should be remarked that the distribution of life expectancies across types will be more differentiated in a society with private financing of medical care. For even in our utilitarian solution, the same amount is expended on treating the occurrence of a disease in a person, regardless of his type. That is not the case in a private system, where more is spent on treatment of given diseases in rich people than in poor people. In the United States, the utilitarian solution would surely be more just than what we observe. In particular, the utilitarian solution would perform better with regard to equalizing opportunities for QALYs than does the present system.

The reader may be surprised that the EOp solution does not narrow the type differential of life expectancies more than it does. This is because of our choice of instrument. Note that an occurrence of a disease (in this case, only cancer) in either type receives the same treatment. If we were willing to spend more on treating cancer in poor individuals than in rich individuals, then the life-expectancy differential between types could be narrowed much more. But this would violate what is perhaps another social norm, that of horizontal equity, that the treatment an individual receives should be independent of his type, once the disease is contracted. Thus, my choice of instrument in the example was a compromise, trading off equal opportunity with horizontal equity.

Before proceeding, I want to reconsider a comment I made earlier, that we might want to include sex in the list of circumstances. In many parts of the world, this would be a good thing-- it would serve to shift medical resources to women, who are receiving fewer of them than they should. It must be remarked, however, that in the advanced countries, this may not be the correct approach. In all advanced countries, life expectancy is greater for women than for men; if we included sex in the list of circumstances, the effect would be to shift medical resources from women to men, in an effort to equalize their QALYs which, in particular, would involve equalizing their life expectancies! This point has recently been discussed by John Kekes, in the context of a Rawlsian theory of health care.¹⁰ It is pertinent to note that WHO, in its definition of equity, specifically excepts differences in health status due to natural, biological variation, from the list of inequities in health. The issue of male-female life expectancy may well be a case in point. If having a shorter life is a biological attribute of maleness, normal and ubiquitous in the species, then trying to equalize life expectancies across the sexes is not necessary to equalize opportunities for health. On the other hand, if shorter male life spans are due to greater occupational stresses, and so on, then it would be appropriate to include sex as a component of circumstance.

¹⁰ "A question for egalitarians," *Ethics* 107, 1997: 658-69

Finally, I wish to observe that what I've solved here can be called the micro-allocation problem. There are other policies, which the society should activate, whose purpose is to *improve the distributions* of life-style quality in the various types: education about health, subsidizing healthy practices, outlawing the advertising of tobacco, etc. I call this the macro-allocation problem. Often, the macro-allocation problem is associated with prevention. Society clearly should spend a certain fraction of its health care budget not in treating diseases once they occur, but in improving life-style qualities of its citizens. This means not only changing behavior, but legislating against unhealthful working conditions, food and drug regulations, and so on. This is, as it stands, a trite statement: what is perhaps less trite is to remark that these 'macro' expenditures can be evaluated using the EOp tool. We allocate dollars to improving life-style qualities to the extent that that allocation is effective in increasing the value of our equal-opportunity objective.

4. Applying the theory to health: Part 2. The delivery of health care and the allocation of costs

The full analysis of equity in health care requires not only solving the delivery of health care problem, but solving the allocation of cost problem, as well. It would be convenient if we could solve these two problems separately¹¹. Having solved the first one above, we could now analyze separately the problem of cost allocation. Unfortunately, this is not the correct way to proceed. Conceptual clarity requires that we solve the two problems simultaneously. This analysis is naturally more difficult than what we have just gone through. Our task now is to find not only the optimal disease expenditure vector, but the total amount of the health budget, and its allocation among citizens.

¹¹ In the literature, the two problems are often dealt with separately. See, for instance, the two papers by van Doorslaer and Wagstaff. This first, referred to earlier, discusses only the problem of health care delivery. The second is "Equity in the finance of health care: Some international comparisons," *Journal of Health Economics* 11, 1992, : 361-387

To simplify our analysis, I will assume that society has decided upon the total amount of the health-care budget, what fraction of GNP should be spent on health care. We must solve, then, for both the disease- expenditure vector and the allocation of costs across individuals.

Here again we have many alternatives. The budget for medical care could be raised through insurance premiums or income taxation or consumption taxes (e.g., on tobacco, alcohol, and fat content of foods). We could, more generally, use all three methods. I cannot discuss all the possibilities. I shall use income taxation as the method, for the sake of simplicity, although I might well advocate a mixture of the three methods in actual practice. During this discussion, it is important to recall that I am separating the issues of what the equal-opportunity policy *is*, and what policy is politically feasible and stable. For the moment, I ignore the issue of political stability, but shall return to it later.

We must first consider what the objective is. We can no longer define it, simply, as QALYs, for we must also consider the costs to the individual of paying his share of the health budget, whatever we decide that is. These costs should be measured in units comparable to QALYs. Thus, we should think of the cost an individual incurs by paying \$1,000 for health care in a year as a *welfare* cost to her. Let us say, to approximate, that her welfare cost is c units per dollar paid. Then the new objective would be:

her QALYs minus c times her health care expenditure.

The number c will be larger, the lower is the individual's income. A poor person, that is to say, incurs a larger welfare cost from spending \$1,000 on health care than a rich person does. So to define our new objective precisely, we need to decide upon the values of c for each level of income in society. I will have nothing further to say about how to calculate these numbers.

Next, to the instrument. I have arbitrarily chosen this to be income taxation. Ideally, we would like to be able to tax a person based not only on his income but on his other

relevant characteristics: his education, occupation, age, and life-style quality. It would, however, be very difficult to collect taxes based on life-style quality, so we will have to settle for taxes based, let us say, on education, occupation, age, and income. The income tax form would require a person to report these data. Our full instrument is the disease expenditure vector and the tax schedule, which specifies the tax a person pays as a function of her income and type. In the simplest case, we use a pure income tax, which predicates the tax only on income. But I will assume that to some extent we can also predicate the tax on type; that is, the tax schedules may differ across types, as in the US, where disabled people receive some tax credits. As before, there will be an optimal solution to the EOp problem, subject to the constraint that the revenues collected equal the budget, whose value I took, above, to be set.

Let me comment upon the solution. The higher the value of c for an income class, the less members of that income class will tend to pay in health taxes. Thus, the rich, other things equal, will pay more than the poor. Taxes will also tend to be larger for members of types that have good life-style quality distributions: that is, health-care taxation will effectively subsidize types who have bad life-style-quality distributions. Since no individual, however, will report her life-style practices, those with less healthful practices will not be taxed more. As in the example of the last section, welfare will increase with life-style quality in both types.

There is a contentious aspect of the solution that should be mentioned. In the previous section, the objective of our equal opportunity problem was QALYs; here it is a more general conception of *welfare*. While it may be within the jurisdiction of the Health Ministry to equalize opportunities for QALYs, it is not within their jurisdiction to equalize opportunities for overall welfare. The citizenry may well accept the view that opportunities for QALYs should be equalized, but not accept the view that opportunities for a more pervasive kind of welfare should also be equalized. Moreover, even in this section, we have taken the health budget as given. That budget, too, would at some point be endogenous, in

the sense of emerging from a pervasive computation that seeks to equalize opportunities for overall welfare of citizens. Nevertheless, we need not endorse that pervasive a jurisdiction for the equal-opportunity ethic to agree to the attractiveness of equalizing opportunities for QALYs, independent of the size of the health care budget and its method of financing.

It is time to consider the political stability of the proposed solution. Since wealthy individuals with high education (advantaged types) will pay more into the health care budget than poor, poorly educated persons, the solution is vulnerable to a political rebellion by the well-off. If this is indeed a danger, then we must search for the solution which is closest to the correct solution that we calculate *and* is politically stable. This might mean that we simply fund health care out of general revenues, and do not ask taxpayers to report their type. The rich, under this regime, will subsidize the poor, but the subsidy will not be perfectly in line with what equal opportunity requires. As earlier, the choice of instrument represents a compromise between equalizing opportunities and political feasibility.

Similar remarks apply to the choice of an insurance mechanism versus a tax mechanism. From the point of view of implementing equality of opportunity for health, both mechanisms can do a good job. The more information we are able to collect on individuals, with regard to their type and effort, the closer will the calculated solutions be to the ideal equal-opportunity regime. The choice between these financing mechanisms is predicated mainly on political criteria. General taxation is often viewed as being a more politically stable way of financing national social security programs than insurance. It must be noted that when I speak of insurance, I do not mean competitive insurance priced by profit-making firms. We, the Ministry of Health, would solve the insurance problem to maximize not profits but our equal-opportunity objective. For this reason, from the ethical viewpoint, there is no reason to prefer funding out of general revenues over funding via a separate social insurance procedure. The differences, as I said, only appear when political considerations are taken into account.

Finally, as I said earlier, there is yet a third source of funding: consumption taxes. The principle would be to tax consumption of unhealthy commodities. This principle, however, is in general more regressive than income taxation and insurance, since all individuals, regardless of income, would pay the same tax for consuming the commodities in question. Nevertheless, using taxes on tobacco to fund health care may be one of the more popular methods of financing in some countries. And taxing unhealthy commodities will also serve to reduce their consumption, which is to say, to improve society's distribution of life-style quality.

5. Conclusion

Let me review some of the key points of the analysis.

1. First and foremost, contemporary egalitarian theory has carved out an important place for personal responsibility. In intellectual and political history, individual responsibility was uniquely the province of the political right. In the last twenty-five years, the left has recognized the salience of responsibility for its social theory, as well, as I have tried to outline. This has, I think, produced a theory of equality that is consonant with the basic intuitions that most people have. Those intuitions are that, to the extent that risks are freely chosen, resulting inequalities of condition are not unjust. To articulate this properly, however, requires a view about responsibility.

One should note that, unlike the utilitarian and full-egalitarian¹² recommendations, the EOp solution is not *consequentialist*. That is, the utilitarian and full egalitarian solution can be computed without knowing the efforts expended by individuals – they take as mathematical arguments only the profile of life expectancies in the population. The EOp solution, in contrast, requires knowledge not only of the profile of life expectancies, but of the effort profile, and the types of individuals. Informally speaking,

¹² By which I mean the solution that maximizes the minimum life expectancy in the population, sometimes called the Rawlsian solution.

to equalize opportunities requires how hard individuals have tried, not only how much they have achieved.

2. The equal-opportunity view that I have espoused is consonant with the view of equity espoused by the WHO. There are some contentious aspects of the equal-opportunity ethic. For instance, the fact, if it is one, that some people who smoke chose 'more freely' to do so than others who smoke, means that, according to the equal-opportunity view, they are owed less compensation by society for the damage to their health than those others are.

This view will doubtless raise objections from many health policy makers, who will see it as leading to an ethically unacceptable assignment of costs to individual, rather than to social, accounts. Let me, therefore, reiterate the argument. I assert there is a fact of the matter, in regard to a person's responsibility for her smoking behavior. The fact of the matter may be that no one should be held accountable for her smoking behavior: this would be so if, for instance, the decision to smoke is made before the 'age of consent' (the age at which we deem persons to be responsible for their behavior), is induced by social forces such as pernicious advertising of tobacco companies, and that, once hooked, a person's smoking is an addiction, the escape from which depends not on acts of autonomous volition, but on the person's 'biological circumstances.' Something like this view is, indeed, held by many people who are experts on tobacco and health policy. If this were the case, then a person's smoking behavior – more generally, her life-style quality-- would be, in our theory, considered a circumstance, not an assemblage of acts of autonomous volition. The consequence would be that no one would be penalized for smoking.

However, the fact of the matter may well be different: it may be that, to some extent, individuals are capable, as adults, of moderating their smoking behavior, and that we deem that whether or not they do so is not entirely a matter of circumstance. We may decide, that is, that the decision a person makes in regard to the intensity of his smoking is, once the

circumstances that define type have been accounted for, as voluntary as his decision whether or not to drive a motor cycle or skydive off cliffs. In that case, there's no reason to hold him less accountable for his smoking behavior than for his skydiving behavior.

Indeed, many health policy makers who take the view that smoking is an addiction beyond the person's control also advocate 'sin taxes' on tobacco. The simultaneous advocacy of these two positions is, I think, inconsistent. On the one hand, if smoking is entirely beyond the control of individuals, then there is certainly no ethical justification (from an equal-opportunity perspective) in taxing them for the behavior. On the other hand, if the justification for such taxation is that it will reduce smoking, that is an admission that the behavior is not entirely beyond the control of individuals.

3. While health-care professionals and health-care ethicists make decisions daily, and episodically, in which they ration health care in one way or another, I have taken certain general principles of distributive justice and asked what allocation of health care and incidence of its costs they lead to, if applied in an all-encompassing way to a society. With the disease-expenditure vector as instrument, health expenditures on diseases of advantaged types are rationed, relative to what would be spent on them in either an unregulated market system, or even under a 'utilitarian' ethic.

4. I further observed that conceptually, it is not correct to separate the delivery of health care decision from the financing decision. Of course, approximations to the ideal equal-opportunity solution can be arrived at by treating the two problems separately, and the manner in which a government decentralizes its activities may require separating the solution of these problems to some extent, in practice.

5. I remarked often upon the importance -- again conceptually -- of separating the question of what constitutes the equal-opportunity solution to the health-care problem from the question of what solutions are politically feasible or stable. The proper formulation of the problem is: we seek the solution which maximizes the degree of equality of opportunity for

health in society subject to the constraint that the solution be politically stable. Often, I think, this conceptual clarity is absent in the literature. I assert there is a value to understanding what the ethically ideal solution to the problem is, were there no political constraints. It is then proper to ask what compromises must be admitted for the sake of political tractability. An example is that it would be ideal, were we able to tax people, or charge them insurance premiums, based on their circumstances and the quality of their lifestyle. Doing so, however, would almost certainly not be politically feasible. Therefore, we must compromise and not use all the information that it would be nice to be able to use.

What I have proposed here would doubtless be altered by experiment, by actually trying it out. The above can be only a rough glimpse of what an equal-opportunity health policy would eventually look like.

Appendix

This appendix solves the EOp problem for the example of section 3. The notation below follows that of Roemer(1998).

We must first define the life-expectancy functions of the individuals in the two types. Converting from absolute efforts to centiles of effort, the probability that a rich person at centile x_c of his effort distribution contracts cancer is $1-2(x_c+0.5)/3$; the probability that a poor person contracts cancer is $1-2x_t/3$; the probability that a poor person contracts tuberculosis is $1-x_t/3$; the probability that a poor person contracts both diseases is $(1-2x_t/3)(1-x_t/3)$. Thus, we can write the life expectancy of a rich person as

$$v^R(\pi, x_c) = \frac{2}{3}(\pi + 0.5)70 + (1 - \frac{2}{3}(\pi + 0.5))(60 + 10\frac{x_c - 1}{x_c + 1}).$$

The life expectancy of a poor person is

$$v^P(\pi, x_c, x_t) = \frac{\pi}{3}\frac{2\pi}{3}70 + \frac{\pi}{3}(1 - \frac{2\pi}{3})(60 + 10\frac{x_c - 1}{x_c + 1}) + (1 - \frac{\pi}{3})\frac{2\pi}{3}(50 + 20\frac{.1x_t - 1}{.1x_t + 1}) + (1 - \frac{\pi}{3})(1 - \frac{2\pi}{3})\text{Min}[(50 + 20\frac{.1x_t - 1}{.1x_t + 1}), (60 + 10\frac{x_c - 1}{x_c + 1})]$$

Letting f_c^R be the fraction of the Rich who contract cancer, q^R and q^P be the fraction of Rich and Poor in society, and r be the per capita health budget, the budget constraint is

$$(q^R f_c^R + q^P f_c^P)x_c + q^P f_t^P x_t = r.$$

We easily compute from the data the various fractions of types who contract diseases.

Our objective is to choose (x_c, x_t) to

$$\text{Maximize}_{x_c, x_t} \int_0^1 \text{Min}[v^R(\pi, x_c), v^P(\pi, x_c, x_t)]d\pi.$$

We use the budget constraint to express x_c in terms of x_t , thus reducing the optimization to a one dimensional problem. Graphing the functions v^P and v^R for various values of x_t , we

see that the v^P function lies always entirely below the v^R function, so the above integral becomes

$$\text{Maximize} \int_0^1 v^P(\pi, x_c, x_t) d\pi.$$

The solution is readily found by simulation.

The utilitarian program is:

$$\text{Maximize} \int_0^1 (q^R v^R(\pi, x_c) + q^P v^P(\pi, x_c, x_t)) d\pi;$$

the solution is easily found by simulation.

