Reply

Horizontal equity in the delivery of health care*

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1. Introduction

In his comments on our paper,[1] Le Grand (1991) makes several valid points. We accept that many of the points in our paper could have been made more simply and that the empirical analysis does nothing to overcome what Le Grand calls the aggregation problem. But Le Grand's defence of his earlier work on equity in the delivery of health care [Le Grand (1978)] is, we believe, flawed. Moreover, his comments on our approach contain some inaccuracies.

2. Defining and measuring inequity

Our interest (and, so it would seem, Le Grand's too) lies with the notion of *horizontal equity*. Hence our interpretation of equity as 'equal treatment for equal need'. In practice we interpret this to mean that persons with the

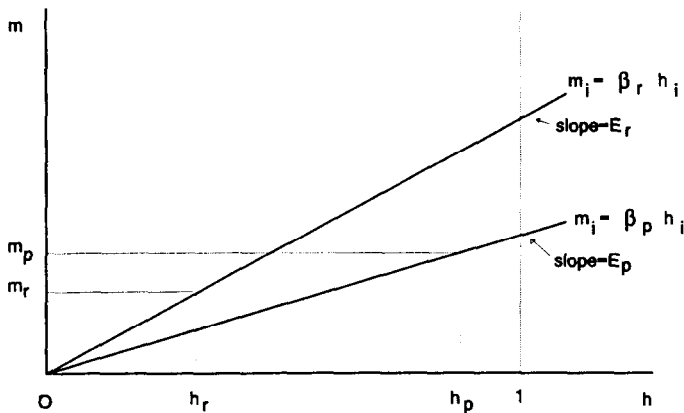   [1]Wagstaff, van Doorslaer and Paci (1991).

Fig. 1. Horizontal inequity and Le Grand-type vertical equity.

same degree of reported sickness ought to receive the same amount of resources. Thus, all persons reporting illness ought to receive the same amount of resources, as ought all persons *not* reporting illness.

Le Grand goes further than this. In addition he requires *on equity grounds* that persons not reporting illness should receive no treatment. Persons in this group, it is argued, are not in need of health care.

Le Grand's statement is, of course, a statement about *vertical* equity. Let us suppose for the moment that it is accepted. Now, expenditure per person ill amongst the rich, E_r, is equal to m_r/h_r, which, in the case of the model in eqs. (2) of our paper, is equal to $[(\alpha_r/h_r)+\beta_r]$. Expenditure per person ill amongst the poor, E_p, is defined analogously. Thus, one possible explanation for E_r being bigger than E_p is that there is vertical equity ($\alpha_r=\alpha_p=0$) but horizontal inequity ($\beta_r>\beta_p$). This is shown diagrammatically in fig. 1. But there is another possibility, namely that $E_r>E_p$ because there is vertical inequity ($\alpha_r\neq0, \alpha_p\neq0$) but horizontal equity ($\beta_r=\beta_p$ and $\alpha_r=\alpha_p$). This is the situation depicted in fig. 2. Le Grand's approach cannot distingish between these two situations. Thus, instead of concluding that 'equality of use for equal need has not been achieved' [Le Grand (1982, p. 46)], Le Grand might equally well have concluded that Le Grand-type vertical equity has not been achieved. There is nothing in his results that tells us which is closer to the truth. All that Le Grand can, in fact, conclude from his results is that one or other – or both – of his equity principles is being violated.

Later in his comment Le Grand suggests that it would be 'more reasonable' to extend the definition of equity to require not only that $\alpha_r=\alpha_p=0$ and $\beta_r=\beta_p$, but also that $\delta_r=\delta_p=0$, i.e., that the elderly (women) be treated no differently from the non-elderly (men). This is, of course, also a
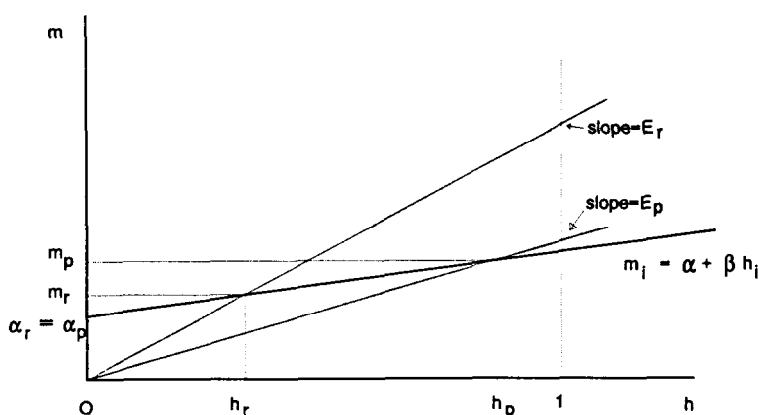
Fig. 2. Horizontal equity and Le Grand-type vertical inequity.

horizontal equity principle, but here equals are defined in terms of age (or gender) rather than need. Let us assume for the moment that the principle is accepted. Also assume, for the moment, that vertical equity à la Le Grand is both acceptable and attained $(\alpha_r = \alpha_p = 0)$. Suppose now that one investigates inequity using Le Grand's standardized expenditures per person ill, $E_r^* = m_r^*/h_r^*$ and $E_p^* = m_p^*/h_p^*$. It can be shown that, with $\alpha_r = 0$, m_r^* can be written as

$$m_r^* = \beta_r h_r^* + \delta_r x,$$

where

$$h_r^* = \theta_r + \mu_r x = f_y h_{ry} + f_o h_{ro}$$

is the age-standardized illness rate of the rich, and h_{ry} is the illness rate amongst those who are rich and young, and so on. One would expect to find – as, indeed, Le Grand (1978) does – that $h_r^* > h_r$ and $h_p^* < h_p$, i.e., standardization is likely to reduce the health differences between rich and poor, but that $h_p^* > h_r^*$. So, E_r^* is equal to $[\beta_r + \delta_r(x/h_r^*)]$, and analogously for the poor. One reason why one might find $E_r^* > E_p^*$ is that though there is no unfair differential treatment of the elderly vis-à-vis the non-elderly $(\delta_r = \delta_p = 0)$, there is horizontal inequity $(\beta_r > \beta_p)$. This is similar to the case depicted in fig. 1, except that one uses h_r^* and h_p^* to compute E_r^* and E_p^* instead of using h_r and h_p to compute E_r and E_p; in this case, of course, it makes no difference whether one uses E_r or E_r^* to assess inequity, since the two figures give the same result. But there is another possible explanation as to why E_r^* might exceed E_p^*: inequity in the treatment of the elderly vis-à-vis the non-elderly $(\delta_r \neq 0, \delta_p \neq 0)$ may be coupled with horizontal equity $(\beta_r = \beta_p$ and $\delta_r = \delta_p)$. This is like the situation depicted in fig. 2, except that the

vertical intercept of the regression line is equal to $\delta_r x = \delta_p x$ and, instead of using h_r and h_p to compute E_r and E_p, one uses h_r^* and h_p^* to compute E_r^* and E_p^*. Clearly, unless $h_p^* = h_r^*$ we will observe $E_r^* > E_p^*$. Once again, all that Le Grand can conclude from his results is that one or other – or both – of his equity principles is being violated.

Thus, even if one accepts Le Grand's views about the fairness of not providing medical care to the non-sick and of not discriminating on the grounds of age and gender, one cannot conclude from his method whether those in equal need of health care are or are not being treated equally. This suggests that introducing these two additional notions of equity into the discussion may not be very fruitful.

This is particularly so when one realizes just how restrictive these notions are. In the context of vertical equity it is worth remembering that in all three empirical studies referred to by Le Grand, health care resources include general practitioner care, much of which may be preventive in character; in our Italian sample, for example, 43% of the non-sick (defined as those whose self-assessed health was at least good) received some medical care. To say that equity demands that the non-sick receive no resources is clearly extremely strong. We would prefer to say no more than that the sick have a level of need that is different from that of the non-sick. We suspect that the non-sick will, in practice, receive less resources than the sick, but we do not require that this be the case in our approach. Nor do we make any judgement about whether or not the current degree of differential treatment between the sick and the non-stick is (vertically) equitable.

Le Grand's requirements that there be no differential treatment of the elderly and non-elderly, and of men and women, also seem unacceptably strong. We would prefer to say no more than that the elderly may, in practice, be treated differently from the non-elderly, and men may, in practice, be treated differently from women. We make no judgement in our approach about whether or not any differential treatment is equitable.

Departing from these less restrictive premises, it follows automatically that equal treatment for equal need requires that $\alpha_r = \alpha_p$, $\beta_r = \beta_p$ and $\delta_r = \delta_p$. The approach we proposed in our paper aims to detect violations of these conditions. That it will only detect horizontal inequality when one or more of these conditions is violated can be seen from fig. 2. Our standardized expenditure per person ill in the case of the rich group is equal to

$$E_r^+ = m_r^+/h = (\alpha_r + \beta_r h + \delta_r x)/h,$$

where x and h are the sample means of x_i and h_i. Thus, in fig. 2 the vertical intercept is $\alpha_r + \delta_r x = \alpha_p + \delta_p x$, but instead of using h_r and h_p to compute E_r and E_p, we use h for both income groups to compute E_r^+ and E_p^+. It is clear that in the scenario in fig. 2 we would have $E_r^+ = E_p^+$.

3. Other issues

In our discussion of chronic versus acute conditions we simply wanted to point out that a higher expenditure per person ill for the rich than for the poor might stem from health care providers perceiving there to be some variation in need amongst those classified as ill. In Le Grand's work, persons were classified as ill if they reported either chronic or acute sickness. His results might be due to the fact that in the NHS the amount of extra resources one receives for being ill depends on whether one is chronically sick or acutely sick.[2] Clearly, this applies to variations in need within these categories, too. That such variations exist and are likely to be important for the analysis of inequity is evident from the results obtained by O'Donnell and Propper (1991) from the British *Health and Lifestyle Survey*. We therefore consider it essential to work with finer detail on need than has hitherto been the case if one is to have any chance of successfully determining whether any income-related inequity exists and, if it does, who it favours. It is highly likely, for example, that our negative HI_{WVP} values stem from a failure to take into account the variations in need amongst persons reporting their health as being not good.

Le Grand is correct when he notes that in the empirical illustrations reported in the paper there is only one group of ill people; this was to reduce the length of the paper.[3] He is wrong, however, in his claim that the different signs of the HI_{LG} and HI_{WVP} indices stem from our not having used age–sex standardized data to compute the former.[4] The age–sex standardized HI_{LG} index makes the picture less pro-rich in both countries but does not make it pro-poor in either (the values for Italy and the Netherlands are 0.0181 and 0.0439, respectively).[5]

Le Grand notes that our samples exclude children and that our income variable is not adjusted to reflect differences in family size.[6] These factors may, he suggests, have biased our results in a pro-poor direction. We think it unlikely that inclusion of children would necessarily have given rise to a more pro-rich distribution: authors of several of the country reports in van Doorslaer, Wagstaff and Rutten (1991) find just the opposite. To explore the implications of using equivalent income rather than family income we re-did

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[2]In addition one requires that s_r/s_p be less than c_r/c_p (cf. our Proposition 3).

[3]It is worth noting, perhaps, that most of the ten country reports in van Doorslaer, Wagstaff and Rutten (1991) – including the Dutch and Italian reports – explore the implications of employing more than one health indicator.

[4]The age–sex standardized HI_{LG} index is negative for the Netherlands (but not for Italy) when chronic sickness is used as the need indicator rather than self-assessed health [cf. van Doorslaer, Wagstaff and Janssen (1991), Paci and Wagstaff (1991)].

[5]With a comparable health indicator, similar results are reported by most authors of the ten country reports in van Doorslaer, Wagstaff and Rutten (1991).

[6]Our results, incidentally, are on a per-person basis not a per-family basis. All individuals in a given household were assigned the household's income.

the Dutch analysis[7] using the Central Bureau of Statistics' equivalence scale: the HI_{LG} index actually became even smaller (0.0094). Clearly, however, in both cases further empirical work is required.

4. Conclusions and summary

Le Grand's defence of his approach relies on two additional equity criteria: that the non-sick do not receive medical care (a vertical equity judgement), and that there be no differentiation between men and women and between people of different ages (a horizontal equity judgement but one in which equals are defined in terms of demographic characteristics rather than need).

Even if one accepts these criteria, it is still impossible to tell using Le Grand's method whether or not persons in equal need of medical care are in fact being treated equally; all that one can conclude is that one or more of his equity principles is being violated. Our approach, by contrast, allows one to distinguish between persons in equal need being treated unequally on the one hand, and the non-sick receiving medical care, and age and gender influencing the amount of care received, on the other. Using our approach, therefore, Le Grand would be able to establish which of his equity principles is being violated. Our approach does not, however, require that Le Grand's additional equity criteria be accepted. Indeed, we argued that they are unlikely to command widespread support. It was for this reason that we focussed on inequity as persons in equal need being treated differently.

[7]Data limitations prevented us from doing so for Italy. Hence the use of family income for both countries in the paper.

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