Paying attention to gender and poverty in health research: content and process issues

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Abstract Despite the magnitude of the problem of health inequity within and between countries, little systematic research has been done on the social causes of ill-health. Health researchers have overwhelmingly focused on biomedical research at the level of individuals. Investigations into the health of groups and the determinants of health inequities that lie outside the control of the individual have received a much smaller share of research resources. Ignoring factors such as socioeconomic class, race and gender leads to biases in both the content and process of research. We use two such factors — poverty and gender — to illustrate how this occurs. There is a systematic imbalance in medical journals: research into diseases that predominate in the poorest regions of the world is less likely to be published. In addition, the slow recognition of women's health problems, misdirected and partial approaches to understanding women's and men's health, and the dearth of information on how gender interacts with other social determinants continue to limit the content of health research. In the research community these imbalances in content are linked to biases against researchers from poorer regions and women. Researchers from high-income countries benefit from better funding and infrastructure. Their publications dominate journals and citations, and these researchers also dominate advisory boards. The way to move forward is to correct biases against poverty and gender in research content and processes and provide increased funding and better career incentives to support equity-linked research. Journals need to address equity concerns in their published content and in the publishing process. Efforts to broaden access to research information need to be well resourced, publicized and expanded.

Keywords Health services research; Research design; Bias (Epidemiology); Publication bias; Poverty; Gender identity; Women's health; Health status; Social justice; Socioeconomic factors; Access to information; Periodicals; Developing countries (*source: MeSH, INSERM*).

Mots clés Recherche en santé publique; Projet recherche; Biais (Epidémiologie); Biais publication; Pauvreté; Identité masculin féminin; Santé féminine; Etat sanitaire; Justice sociale; Facteur socio-économique; Accès à l'information; Périodique; Pays en développement (*source: MeSH, NLM*).

Palabras clave Investigación sobre servicios de salud; Proyectos de investigación; Sesgo (Epidemiología); Sesgo (Epidemiología); Pobreza; Identidad sexual; Salud de las mujeres; Estado de salud; Justicia social; Factores socioeconómicos; Acceso a la información; Publicaciones periódicas; Paises en desarrollo (*fuente: DeCS, BIREME*).

Arabic

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Voir page 744 le résumé en français. En la página 744 figura un resumen en español.

Poverty, gender and health equity

Inequity in health stems from a range of social and economic determinants. This paper highlights two particular markers of health disparity that are among the most consistently important: poverty and gender. The relationship between poverty, health disparities and gender is multidimensional. Poverty is known to cause ill-health through poor nutrition, unhealthy living and working conditions. But ill-health can itself cause poverty. A study in rural India found that ill-health and health-related expenses played a critical part in pushing households into poverty in more than 80% of cases. Female-headed households were particularly susceptible to the effects of poverty, with 87% of such households being poor (*1*). Health inequities and their links to poverty and gender are likely to remain among the key health challenges of the 21st century.

Impressive gains in average life expectancy and child survival have been achieved, along with improvements in average health status, in both high- and low-income countries during the second half of the 20th century. The dramatic decline in mortality observed during these decades in developing countries (at least until the onset of the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) pandemic) was largely due to advances in public health measures and supportive macroeconomic policies. Nonetheless, these improvements in population health have not been equally distributed. Economic inequalities and social injustices continue to deny

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good health to many, and they remain obstacles to continued health gains worldwide. There is considerable variation in the pace and level of health achievements (*2*, *3*). Health inequities are pervasive both between and within countries across the globe (Table 1).

Health inequity and health research

The disparities in health status between and within countries are particularly disturbing considering that equity has been a stated goal of health policies for several decades. One reason why these disparities persist is because statements about health goals have not been effectively followed up with policies and programmes that focused on reducing disparities. An important factor contributing to this lacuna is the dearth of equity-focused research that could generate the knowledge to support such policies. Considering the magnitude of the problem of health inequity from the point of view of human development and well-being, it is striking how little systematic research has been done on the social causes of ill-health.

The overwhelming focus of the health research community has been on biomedical determinants of health and illness at the level of individuals. Östlin & Paraje (unpublished data, 2004) scrutinized worldwide health-related scientific literature using the ISI database (http://www.isinet.com/) for the period 1992–2001 and found that only 0.2% of the total of 3 361 298 health-related articles dealt with health inequalities between population groups defined by, for example, socioeconomic group, poverty level, ethnicity, race, caste or gender. In order to understand health inequalities that are related to social characteristics, individuals need to be grouped according to those characteristics (*4*). Investigations into the health of population groups and the determinants of health inequities that lie outside the control of the individual have received a much smaller share of research funding. The weight of resources is tilted towards biomedical research that produces knowledge needed by health service providers in order to offer curative treatment or advice. Correspondingly, epidemiological, environmental and public health research have attracted much less attention (*5*). It is clear that this imbalance must be corrected if policies to remedy health inequities are to receive serious attention.

Additionally, until recently research into the nature, causes and consequences of health disparities and their policy implications has been hampered by the absence of a clear definition of equity in health that can be used to guide the measurement of and accountability for the effects of actions. Equity in health has been conceptualized in several ways, its principles deriving from a number of fields, such as philosophy, ethics, economics, medicine and public health. Central to most definitions is the idea that certain health disparities (or health inequalities) are unfair or unjust (*6*, *7*).

Health inequality and health inequity are not synonymous terms. While the term health inequalities describes the differences in health between groups independent of any assessment of their fairness, the term health inequities refers mainly to a subset of inequalities that are deemed unjust. A fundamental question for assessing health equity is how to decide which inequalities are also inequitable. Generally, health inequalities are assessed as inequitable if the disparities are the result of unequal power relations that put specific groups of people at a disadvantage not only economically, socially and politically, but also in terms of their chance to be healthy (*8*, *9*). When assessing health equity it is also important to differentiate between freely chosen behaviours that damage health and behaviours or lifestyles that are socially determined (*10*). Research evidence indicates the importance of the effect of structurally determined lifestyles among less privileged social groups on their health; these need to be corrected by combining structural changes related to economic, living and working conditions with health education efforts. Thus, health equity is an ethical concept that is inherently normative, based on the principle of distributive justice and is consonant with and closely linked to principles of human rights.

Health inequities are often manifested by systematic disparities in health, or its determinants, between socially, demographically or geographically defined populations or subgroups of populations. In some instances, however, the absence of disparities in health outcomes may itself be an indicator of inequity. For instance, similar death rates from coronary heart disease for women and men point to the presence of inequity since women are presumed to be biologically better protected from heart disease due to their higher levels of estrogen (*11*).

The social causes or determinants of a population's health often need to be tackled on the societal level and require action from a broad range of sectors, not just the health-care sector (*12*). Research findings on the determinants of inequities in health

Table 1. **Regional health disparities for selected health indicators**

Region	Mortality rate for children under 5 years/ 1000 live births (2001)	Infant mortality rate/1000 live births (2000)	Maternal mortality rate/100 000 live births (2001)	Prevalence of tuberculosis/100 000 population (2001)
Developed regions	9	8	20	23
Developing regions	90	63	440	144
Northern Africa	43	39	130	27
Sub-Saharan Africa	172	106	920	197
Latin America and the Caribbean	36	29	190	41
Eastern Asia	36	31	55	184
South-central Asia	95	70	520	218
South-eastern Asia	51	39	210	108
Western Asia	62	51	190	40
Oceania	76	66	240	215

Source: (*25*)

can make it easier for different sectors in society to understand their roles and responsibilities in producing, maintaining or reducing inequities (*13*). Efforts at achieving equity in health are predicated on four distinct but related kinds of knowledge:

- the distribution of health and its proximate determinants between and within countries
- the origin and causes of these disparities
- the mechanisms that maintain them and
- effective strategies at global, national and local levels to reduce or eliminate them.

Health research in general and research on health inequalities in particular should play a central part in creating knowledge to inform policy. Research could thereby help eradicate unjust disparities in health and accelerate progress towards the goal of equity.

Inequity in health research and knowledge systems

Unfortunately, it is not only health that is inequitable within and across countries but health research is inequitable as well. Two distinct but linked factors define the nature of inequities in health research: the first has to do with the content of research and the second with the research process itself.

Research content

Imbalances in research content of the kind already mentioned, such as ignoring factors like socioeconomic class, race or gender, may bias estimations of disease burden among populations or population groups. Two factors — poverty and gender — illustrate this well.

The *10/90 report on health research 2001–2002* (*14*) provides an annual update on the continuing disparity between areas where resources for health research are allocated and where the greatest burden of disease is found. According to these reports every year more than US$ 70 billion is spent worldwide on health research and development by the public and private sectors but only about 10% of funding is targeted to the diseases that account for 90% of the global disease burden. The human and economic costs of this misallocation of resources are enormous, particularly for low-income countries and also for the poor within countries.

There is a systematic imbalance in medical journals: research into diseases that predominate in the poorest regions of the world is less likely to be published (*15*). A survey of five leading general medical journals in 2001 found that the frequency of published research articles relevant to diseases associated with poverty was low: 0% for *Annals of Internal Medicine*, 2% for *JAMA*, 4% for the *New England Journal of Medicine*, 6% for the *BMJ*, and 16% for the *Lancet* (*16*).

Gender imbalances in the content of health research are increasingly recognized as having the following dimensions (*17*).

- Research has been slow to recognize health problems that particularly affect women. For example, despite more than 50 years of globally and nationally supported family planning programmes and extensive research into contraceptive behaviour, it is only within the past decade or so that serious research into the prevalence of reproductive tract infections has occurred. The situation is the same for breast cancer and cervical cancer. Similarly, the prevalence and health consequences of domestic violence have been neglected until recently (*18*).
- A broad range of fields have taken misdirected and partial approaches to research. For instance, environmental health research has long ignored the problems of indoor air pollution and smoke-filled kitchens, factors that are critical to the health of poor women in the developing world. Evidence suggests that indoor air pollution is associated with higher risks of tuberculosis, higher levels of blindness and inhibited nutrient uptake among women (*19*). On the other hand, while mental health research has been overly focused on the connections between female reproductive biology and health problems, it often ignores the role of reproduction on men's mental health (*20*).
- There has been a lack of recognition of causally interactive pathways. For example, little attention has been paid to the interaction between gender and other social stratifiers, such as socioeconomic class, race, ethnicity or sexual orientation. Like comorbidity, these causal interactions make problems more complex and require more intensive research efforts. A positive example of such efforts is in the area of HIV/AIDS where there was recognition relatively early on that women were especially vulnerable because of gender–power inequities, which are often related to the economic inequities between men and women. While there has been research on this, particularly in Africa, much more attention needs to be paid to this issue in other parts of the world, such as south Asia for example.

There is growing evidence from various fields of health research, whether biomedical or social, that risk factors, biological mechanisms, clinical manifestations, causes, consequences and management of diseases may differ between men and women. This is related both to sex (biology) and to gender (the social construction of masculinity and femininity). In order to be able to assess which health disparities between men and women reflect inequities, research needs to analyse the complex ways in which biological and social factors interact. Research must also investigate the different experiences, behaviours, social norms and status (power) of men and women that underpin health status, health-seeking behaviour and access to resources. Prevention, treatment, rehabilitation and the delivery of care need to be adapted to take these factors into account. If they are not taken into account, they may adversely impact the health of both women and men.

Research process

Imbalances in research content may reflect and be exacerbated by biases and disparities in the process of health research. The strongest hypothesis for the existence of the 10/90 resource gap in health research is that it is driven by the market for health products, which is quite large in high-income countries. But at least part of the disparity in resources for research may be associated with the fact that the bulk of health research is done by researchers from high-income countries. More than 90% of scientific publications in the field of health research are published by researchers from high-income countries.

The values that influence decisions about the selection of content for medical journals are largely determined by priorities in science, public health and commerce, but the composition of editorial boards is important too because it sends a signal

to authors and readers about a journal's interests. Most board members of leading international medical journals come from nations with a high human development index (*15*) as defined by the United Nations Development Programme's annual *Human Development Report.*

Although not specifically about health research, articles by Wayt (*21*) and Day (*22*) make the points that: the editors of some scientific journals published in high-income countries do not believe that research from developing countries is relevant to most of their readership; of the thousands of scientific journals published in developing countries few are listed in the major citation indexes; and the work of scientists in developing countries is cited less often than that of scientists from developed countries even when it appears in major journals.

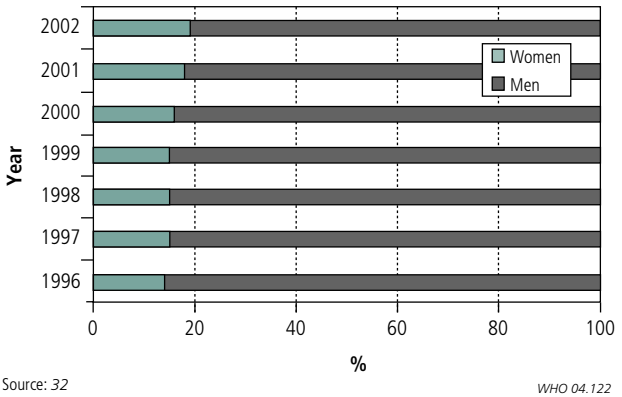
The electronic revolution is providing scientists and health workers in high-income countries with unprecedented access to information, but scientists in some parts of the developing world may not have access to any information except outdated textbooks (*23*). Many scientific journals are now available only electronically, and many researchers in low-income countries cannot gain access to them.

One attempt to improve access to scientific information in low-income countries is the WHO-sponsored public–private partnership known as HINARI (Health Internet Access to Research Initiative). This initiative provides researchers with free access to important medical journals. The BMJ Publishing Group similarly provides free access to the electronic version of its 23 specialist journals to anyone in more than 100 of the poorest countries. But the prerequisite to gaining free access or low-cost access to health journals is the availability of computers and an Internet connection. The digital divide between rich and poor is dramatic both between and within countries, and there is a risk that the information gap between researchers who have access to the Internet and those who do not will become even bigger. In Africa, in 1998 fewer than 1 000 000 people, out of the total population of 700 million, had access to the Internet, and 80% of those who had access were in South Africa. Among the other 20% the ratio of people who had access to the Internet to those who do not is 1 to 5000; in the United States or Europe the ratio is 1 to 6 (*24*). In 2001, the number of Internet users in high-income countries was 396.9 per 1000 people and in middle-income countries it was 36.8 per 1000 people. The corresponding figure for low-income countries was only 1.8 Internet users per 1000 people (*25*). The concern about the digital divide has, however, recently been challenged by World Bank economists. They believe that the most striking feature of the divide in access to information and communication technologies is not the size of the divide but how fast it is shrinking (*26*).

Aside from a lack of access to the Internet, another factor that puts many researchers in low-income countries at a disadvantage is language. The vast majority of the most prestigious international health journals are published only in English; anyone who cannot write competently in English, or cannot afford to have a translation made by a professional translator, will have difficulty in getting published.

Where gender is concerned, although the proportion of women among medical students and faculty members at all levels in the world has increased steadily, their representation on decision-making bodies, such as research funding committees or advisory boards, has not increased accordingly (Fig. 1). Increasing the proportion of female scientific advisers on decision-making bodies is not a guarantee that gender will be included in mainstream health research. However, developing

Fig. 1. **Membership of WHO expert advisory committees, by sex, 1996–2002**



Source: *32*

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a critical mass of women may increase the probability that existing research cultures will be transformed and thus create a more conducive environment for gender issues to be addressed in research. There is growing evidence of differential treatment of female scientists in terms of career opportunities, salary and as applicants for research funds and postdoctoral fellowships (*27*, *28*).

An equally important but different kind of problem with methods used in medical and pharmaceutical research has been the exclusion of female participants from study populations. The reasons often given for excluding female participants are that the menstrual cycle introduces a potentially confounding variable into the study and there are fears that experimental treatments or drugs may affect female fertility and expose fetuses to unknown risks. The consequences of treating research results based on studies of male participants alone as universally valid, without convincing evidence of their applicability to women, may be harmful to women as, for example, in the case of myocardial infarction (*29*).

Steps forward

Our analysis points to significant gaps in both the content and processes of health research when it comes to addressing gender and poverty, both of which are major contributors to inequities in health outcomes. Because the gaps are wide, we discuss here some minimum steps that need to be taken in order to start closing these gaps.

As far as content is concerned, the prerequisites for conducting equity-focused health research are to collect disaggregated income data and gender data in individual research projects or through larger data systems, to pay attention to the possibility that data may reflect systematic poverty or gender biases, and to use methods that are sensitive enough to capture the different dimensions of disparity.

Research needs to focus more on both the "diseases of the poor" and also on the possibility that risk factors, biological mechanisms, clinical manifestations, causes, consequences and management of diseases may differ between men and women. It also needs to be recognized that these differences may contribute to inequities in health outcomes. Health researchers also need to understand the importance of interactions among different forms of social discrimination, such as poverty, race or caste, sexual orientation and gender. These determinants often

combine to create multiple barriers to good health. Presenting data in a manner that allows cross-tabulation and classification between and among different stratifiers will enable researchers to gain a better understanding of the mechanisms behind health inequities.

Where research processes are concerned, there need to be stronger incentives for researchers in low-income countries (as well as in high-income countries) to focus on equity-linked research. Health journals need to make a serious effort to address the composition of their editorial boards. Efforts such as HINARI need to be well funded, publicized and expanded. Priority needs to be given to addressing the differential treatment of female scientists as well as correcting the gender imbalance in organizations and advisory bodies that fund or conduct health research. The actions identified above may well need to be triggered by other prior actions that serve to highlight the need for doing them. At the level of national policy, two of the most influential factors identified as triggers for encouraging decisive action relate to health research (*30*, *31*). The first is the importance of scientific evidence documenting the existence and scale of health inequalities; this acts as an important political force to keep equity issues in the public eye and to push equity up the public health agenda. If the facts relating to the social distribution of health are not recorded, the problems remain invisible.

Second, alliances and communication between policy-makers, health scientists, health professionals, nongovernmental organizations and the public can play a crucial part in keeping the causes and consequences of inequalities on the public agenda. In such a coalition, the research community provides the scientific evidence upon which equity-oriented strategies can be built, policy-makers and health professionals ensure that there are prerequisites in place for their implementation and the public, through its engagement, helps to monitor equity-oriented strategies and set priorities for policy attention. ■

Conflicts of interest: none declared.

Résumé

Tenir compte des inégalités homme-femme et de la pauvreté dans la recherche en santé : impact sur les contenus et les méthodes

Malgré l'ampleur du problème des inégalités de santé d'un pays à l'autre et à l'intérieur d'un même pays, rares sont les recherches systématiques qui ont été consacrées aux causes sociales du mauvais état de santé. Les chercheurs en santé publique s'intéressent dans leur grande majorité à la recherche biomédicale au niveau de l'individu. Les travaux sur la santé des groupes et sur les déterminants des inégalités de santé qui ne dépendent pas de l'individu ne bénéficient que d'une maigre part des ressources. En ignorant des facteurs tels que la classe socio-économique, la race et le sexe, on fausse à la fois le contenu et les méthodes de la recherche. Nous utilisons ici deux de ces facteurs, les inégalités homme-femme et la pauvreté, pour illustrer notre propos. Il existe un déséquilibre systématique dans les revues médicales : les recherches sur les maladies qui prédominent dans les régions les plus pauvres ont une probabilité plus faible d'être publiées. De plus, la lenteur de la prise de conscience des problèmes de santé de la femme, les approches malciblées et partiales de la connaissance de la santé masculine et féminine ainsi que le manque d'informations sur la façon dont l'appartenance à l'un ou l'autre sexe interagit avec les autres déterminants sociaux continuent à limiter le contenu de la recherche en santé. Dans la communauté scientifique et médicale, ces déséquilibres au niveau des contenus sont liés à des biais au détriment des chercheurs des régions pauvres et des femmes. Les chercheurs des pays à haut revenu bénéficient d'un meilleur financement et d'une meilleure infrastructure. Leurs publications dominent les revues et les citations et ils occupent également une position dominante dans les comités consultatifs. Le moyen de remédier à cet état de fait consiste à corriger les biais concernant la pauvreté et les inégalités homme-femme dans le contenu et les méthodes de la recherche et de fournir un financement accru et de plus fortes motivations professionnelles afin de favoriser une recherche visant le respect de l'équité. Les revues doivent aborder les questions d'équité dans leur contenu et dans leur politique de publication. Les efforts visant à élargir l'accès à l'information en matière de recherche doivent bénéficier de ressources suffisantes, être mieux connus et renforcés.

Resumen

Prestar atención al género y la pobreza en las investigaciones sanitarias: aspectos relacionados con el contenido y con el proceso de publicación

Pese a la magnitud del problema que plantean las inequidades sanitarias en y entre los países, son pocas las investigaciones sistemáticas realizadas sobre las causas sociales de la mala salud. Los investigadores de la salud han centrado abrumadoramente sus estudios biomédicos en los individuos, mientras que las investigaciones sobre la salud de grupos y los factores determinantes de las inequidades sanitarias que escapan al control del individuo han recibido una proporción mucho menor de los recursos de investigación. Ignorar factores como la clase socioeconómica, la raza y el género produce sesgos tanto en el contenido de las investigaciones como en los procesos de publicación. Para ilustrar esto, hemos usado dos de esos factores: la pobreza y el género. Se observa en las revistas médicas un desequilibrio sistemático: las investigaciones sobre las enfermedades predominantes en las regiones más pobres del mundo tienen menos probabilidades de publicarse. Además, el lento reconocimiento de los problemas de salud de la mujer, las estrategias mal encaminadas y parciales utilizadas para comprender la salud de las mujeres y los hombres y la escasa información disponible sobre la interacción del género con otros determinantes sociales siguen limitando el contenido de las investigaciones sanitarias. En la comunidad investigadora esa asimetría en el contenido está relacionada con los sesgos aplicados a los investigadores de las regiones más pobres y las mujeres. Los investigadores de los países de ingresos altos se benefician de una financiación y una infraestructura más adecuadas. Sus publicaciones dominan las revistas y las citas, y estos investigadores dominan también los consejos asesores. La única manera de avanzar en este terreno es corregir los sesgos contra la pobreza y el género en el

contenido y los procedimientos de las investigaciones y ofrecer más financiación y más posibilidades de carrera para apoyar las investigaciones relacionadas con la equidad. Las revistas han de abordar las problemas de equidad que afectan al contenido de sus artículos y al proceso de publicación. Es necesario financiar, publicitar y expandir suficientemente los esfuerzos realizados para ampliar el acceso a los medios de información sobre las investigaciones.

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References

1. Krishna A, Kapila M, Porwal M, Singh V. Falling into poverty in a high growth state: escaping poverty and becoming poor in Gujarat villages. *Economic and Political Weekly* 2003;38:5171-9.
2. Wagstaff A. *Research on equity, poverty and health outcomes. Lessons for the developing world.* Washington (DC): World Bank; 2000.
3. Victora CG, Wagstaff A, Schellenberg JA, Gwatkin D, Claeson M, Habicht J-P. Applying an equity lens to child health and mortality: more of the same is not enough. *Lancet* 2003;362:233-41.
4. Braveman P. Monitoring equity in health and health care: a conceptual framework. *Journal of Health and Population Nutrition* 2003;21:181-92.
5. Saracci R, Olsen J, McMichael A. Europe's health research: getting the right balance. *BMJ* 1998;316:795.
6. Whitehead M. The concepts and principles of equity and health. *International Journal of Health Services* 1992;22:429-45.
7. Braveman P, Gruskin S. Defining equity in health. *Journal of Epidemiology and Community Health* 2003;57:254-8.
8. Peter F, Evans T. Ethical dimensions of health equity. In: Evans T, Whitehead M, Diderichsen F, Bhuiya A, Wirth M, editors. *Challenging inequities in health: from ethics to action.* New York: Oxford University Press; 2001. p. 24-33.
9. Sen G, George A, Östlin P. Engendering health equity: a review of research and policy. In: Sen G, George A, Östlin P, editors. *Engendering international health — the challenge of equity.* Cambridge: MIT Press; 2002. p. 1-34.
10. Stronks K, van de Mheen H, Looman C, Mackenbach JP. Behavioural and structural factors in the explanation of socioeconomic inequalities in health: an empirical analysis. Sociology of Health and Illness 1996;18:653-74.
11. McKinley JB. Some contributions from the social system to gender inequalities in heart disease. *Journal of Health and Social Behavior* 1996;37:1-26.
12. Benzeval M, Judge K, Whitehead M. *Tackling inequalities in health: an agenda for action.* London: King's Fund; 1995.
13. Östlin P, Diderichsen F. Equity-oriented national strategy for public health in Sweden. A case study. Geneva: World Health Organization; 2001 (WHO/EURO Policy Learning Curve Series).
14. Global Forum for Health Research. *The 10/90 report on health research 2001–2002.* Geneva: Global Forum for Health Research; 2002.
15. Horton R. Medical journals: evidence of bias against the disease of poverty. *Lancet* 2003;361:712.
16. Obuaya C-C. Reporting of research and health issues relevant to resource-poor countries in high-impact medical journals. *European Science Editing* 2002;28:72-7.
17. Sen G, George A, Östlin P. The case of gender equity in health research. *Journal of Health Management.* 2002;4:99-117.
18. Garcia-Moreno C. Violence against women: consolidating a public health agenda. In: Sen G, George A, Östlin P, editors. *Engendering international health — the challenge of equity.* Cambridge: MIT Press; 2002. p. 111-42.
19. MishraVN, Retherford RD, Smith KR. Biomass cooking fuels and prevalence of blindness in India. *Journal of Environmental Medicine* 1999;1:189-99.
20. Astbury J. Mental health: gender bias, social position, and depression. In: Sen G, George A, Östlin P, editors. *Engendering international health — the challenge of equity.* Cambridge: MIT Press; 2002. p. 143-66.
21. Wayt GW. Lost science in the Third World. *Scientific American* 1995;273:92-9.
22. Day M. The pride and prejudice: the world may miss out because the fruits of research in developing countries seldom make it to the pages of top journals. *New Scientist* 1997;156:22.
23. Godlee F, Horton R, Smith R. Global information flow. *BMJ* 2000;321:776-7.
24. Tan-Torres Edejer T. Disseminating health information in developing countries: the role of the internet. *BMJ* 2000;321:797-800.
25. United Nations Development Program. *Human Development Report 2003.* New York: Oxford University Press; 2003.
26. Anonymous. Canyon or mirage? *The Economist*, 22 January 2004. Available from: http://economist.com/printedition/displayStory.cfm?Story_ID=2367710
27. Wennerås C, Wold A. Nepotism and sexism in peer-review. *Nature* 1997;387:341-3.
28. Park P. All things unequal, in pay. *The Scientist* 16 September 2002;16:16.
29. Gijsbergs van Wijk CMT, Van Vliet KP, Kolk AM. Gender perspectives and quality of care: towards appropriate and adequate health care for women. *Social Science and Medicine* 1996;43:707-20.
30. Whitehead M. Diffusion of ideas on social inequalities in health: a European perspective. *The Milbank Quarterly* 1998;76:469-92.
31. Machenbach JP, Bakker MJ. Tackling socioeconomic inequalities in health: analysis of European experiences. *Lancet* 2003;362:1409-14.
32. World Health Organization. World Report on "*Knowledge for Better Health*". Geneva: World Health Organization. In press 2004.