Innovations in Rwanda's health system: looking to the future

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Rwanda is making substantial progress towards improvement of health and is working towards achievement of the Millennium Development Goals, which is a challenging task because the country has had genocide in 1994, has few natural resources, is landlocked, and has high population growth. Like many impoverished sub-Saharan countries, Rwanda's health system has had an uncoordinated plethora of donors, shortage of health staff, inequity of access, and poor quality of care in health facilities. This report describes three health system developments introduced by the Rwandan government that are improving these barriers to care—ie, the coordination of donors and external aid with government policy, and monitoring the effectiveness of aid; a country-wide independent community health insurance scheme; and the introduction of a performance-based pay initiative. If these innovations are successful, they might be of interest to other sub-Saharan countries. However, Rwanda still does not have sufficient financial resources for health and will need additional external aid for some time to attain the Millennium Development Goals.

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Introduction

Rwanda—a country with a population of about 9·2 million—has made impressive progress in economic and social development since the 1994 genocide when 1 million people were massacred, 2 million became refugees, and much of the country's health facilities were destroyed. The shadow of genocide remains and a substantial amount of money is still spent on prisons, the village court (gacaca) system, reconciliation between Rwandans, and orphan and widow care.[1] 6 years ago, in an ambitious development plan called Vision 2020, the Government of Rwanda detailed its aims for quadrupling the Growth Domestic Product, making economic recovery a priority, and ending external aid by 2020.[2] To achieve Vision 2020, a healthy nation is needed. Three innovations, which should improve health-service delivery and increase equity of access, are discussed in this report. These innovations are donor coordination of aid, linking it closely with government plans; a nationwide community-based health insurance; and a performance-based pay initiative to improve the quality of health care.

Panel 1: Health indicators

Maternal and child health

- Infant (<1 year) mortality 86/1000
- Mortality in children <5 years 152/1000
- Maternal mortality 750/100 000
- 48·6% of births delivered with the assistance of qualified personnel

HIV/AIDS and other epidemics

- HIV prevalence 3·0%
- Malaria causes 40·0% of consultations in health facilities
- 60·0% of HIV patients are diagnosed with tuberculosis

Others

- Contraceptive prevalence 17·0% among married women
- 60% of Rwandans live within 5 km of a health facility; 85% live within 10 km

Data from reference 3, Demographic and Health Surveys,[10] and Rwandan Ministry of Health.[11]

Rwanda is now well on the road to recovery with the leadership of President Paul Kagame, and living standards have returned to, or surpassed, their pre-1994 levels.[3] Corruption is decreasing,[4] infrastructure has improved, and access to education has greatly increased with parity between girls and boys in primary school. The country's impressive economic growth rate (presently 6% per year) has helped to reduce poverty but income is unequally distributed with a distinct urban to rural divide. 37% of Rwandans (mostly rural) live in extreme poverty, unable to afford basic foods, and 56·9% live on less than the national poverty line.[3] Poverty is worst in rural western and southern provinces, and in households in which women are the heads of the families, which is the case for 32% of the poor. The country's Gini coefficient, which measures economic inequality, is 0·51.[5] Rwanda's projected population growth of 2·3% per year for 2005–10 is higher than the African average and will slow future poverty reduction. If fertility is not adequately controlled, the population will reach 13 million by 2020.[6]

The health sector

Improvement of the accessibility and affordability of health services and the quality of care are key goals of the Health Sector Strategic Plan for 2005–09,[7] which is embedded within the broad framework of the Economic Development and Poverty Reduction Strategy. After the genocide, the Government of Rwanda adopted a district health model, with each district providing all aspects of care to about 20 000 people. However, health centres did not have enough competent staff and equipment and 60–80% of their costs were generated from user fees,[8] which were a crippling burden on the poor who largely turned to traditional medicine as a result. By 2002, the government was spending 8·6% of its revenue on health, which constituted about a third of Rwanda's spending on health; the remainder came from international donors or from the population in the form of direct payments for care.[9] By 2007, government health spending had increased to 9·5% of total public expenditure.[3] The amount spent per person per year (government plus donor) on health is now about $12 to $14.

Like many African countries, Rwanda does not have sufficient trained health staff. Most districts have only two doctors per 100 000 people,[3] which is well below the WHO-suggested minimum of ten doctors per 100 000. Panel 1 shows some of the indicators of the country's health status. Rwanda now has the highest immunisation coverage in Africa. Figures 1 and 2 show trends in mortality rates for infants and children less than 5 years of age, respectively, including projections necessary to achieve the Millennium Development Goals (MDGs). Evidence suggests that the rate of HIV/AIDS is decreasing, with an overall prevalence rate of 3·0%[13] but, for women in Kigali, the rate is 8·6%, partly because of a legacy of genocidal sexual violence.[3] Maternal mortality remains high mainly because of the absence of midwives at the district level and, along with infant mortality, is unlikely to meet the MDGs. However, the building of a national institute of health and five new nursing schools should improve this situation. Malaria is one of the main causes of consultation and accounts for 35% of deaths in children less than 5 years of age per year.[12] Table 1 shows Rwanda's progress towards the MDG targets so far.

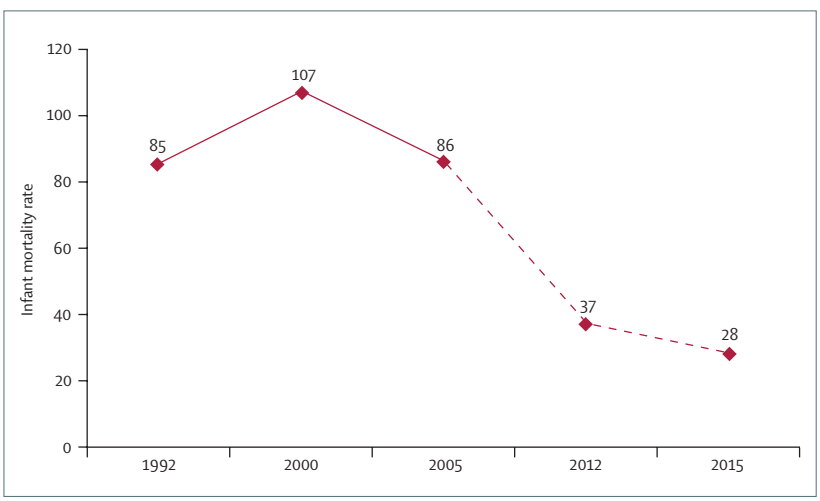

Figure 1: **Infant (age <1 year) mortality rates (deaths per 1000) with Millennium Development Goals projection**
Reproduced from reference 12 with permission.

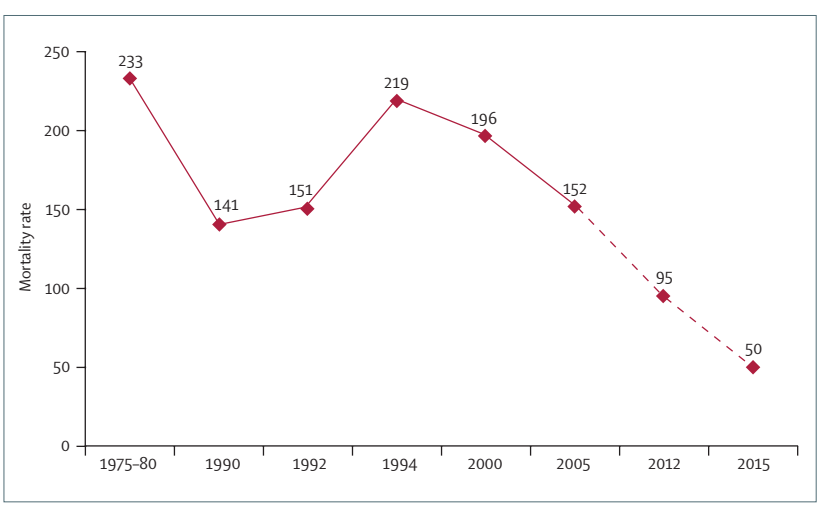

Figure 2: **Mortality rates (deaths per 1000) in children aged less than 5 years with Millennium Development Goals projection**
Reproduced from reference 12 with permission.

Donor coordination

More than half the health sector funding comes from a proliferation of donors or non-government organisations.[3] Rwandan government staff spend 3 days a year to service each aid mission and there are 168 such missions per year.[1] An estimated 27% of all government and donor resources for health are spent on administration. Very short donor timescales lead to continual renegotiation because 55% of donor projects end within 1 year.[14] The timing of aid delivery is often unreliable, whereas other factors, such as inflation or exchange rate variations, can grossly distort the final payout. Long-term health plans are therefore difficult to make.

Effective aid is as much about quality as quantity.[15] In 2006, with the help of the World Bank, the Rwandan government began to integrate all donor funds (for all development activities) within one fiscal framework (or compact agreement) to ensure aid was sustainable in the medium-term to long-term and a development strategy based on estimated costs was supported by the government. This compact agreement contributes to the national poverty reduction plans. The Rwandan government insists on ownership of all development plans and has asked all partners to adhere to them. A high-level forum was set up to oversee this compact agreement, which consists of senior political leadership and the top management of aid agencies—ie, the people with power to change unhelpful procedures. A high-level-development-partners' meeting takes place once a year. The government showcases its achievements and plans future policy with donors in this meeting. Successes and failures are discussed. Several donors (the UK, European Union, World Bank, African Development Bank, Sweden, the Netherlands, and Germany) now give direct budget support, which is coordinated by a budget support harmonisation group that meets twice a year. In 2005, 41% of total aid was in this form but, although budget aid is encouraged, parallel support to particular sectors is not ruled out.

The Government of Rwanda has undertaken to monitor its aid effectiveness and has put in place financial management systems that are open to all donors for examination to ensure the transparency of aid. However, when donors were asked by the government to assess their own efficiency, in line with the guidelines set out in the Paris Declaration on Aid Effectiveness,[16] most were reluctant to agree to peer review each other's performance (panel 2).

Not all donors are likely to provide budget support. The Ministry of Health receives a substantial amount of project support through non-profit non-government organisations and religious institutions, some of which deliver care to areas with reduced accessibility. Even if

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donors baulk at direct support of the government budget, integration of funding is possible at the sectoral level (in what is known as the sector-wide approach or SWAp). Unlike in the education sector, a SWAp for health has not yet emerged, although the Ministry of Health has organised donors into clusters so that they can meet to discuss sector plans and choose priority areas for aid. The goal of this health sector cluster group is to improve the effectiveness and efficiency of aid and align it with the Health Sector Strategic Plan, enshrining the principal of mutual accountability. The Rwandan government has started to insist that small projects adhere to the aims and objectives of the Health Sector Strategic Plan and are subject to a formal appraisal of the effect of both pilot plans and the costs of scaling-up before they are selected.

More donors appear to be aligning their funding with government plans, including bilateral donors and public health partnerships. A good example is the Global Fund to fight AIDS, Tuberculosis, and Malaria, which supports health system development by funding the Mutuelle insurance scheme, renovation of district laboratories, improvement of health facilities and communications and information technology, performance-based financing for HIV/AIDS, and improvement of the prevention of mother to child transmission of HIV/AIDS. The President's Emergency Fund for AIDS (PEPFAR), in addition to providing antiretroviral treatment, contributes towards the improvement of the overall maternal and child health, health-centre computerisation for effective monitoring, improvements in national reference laboratory and quality assurance and control, renovation of peripheral laboratories, and remuneration of health-care workers in facilities they fund.

The Mutuelle de Sante, a community-based insurance scheme

Community-based health insurance schemes are increasingly used to mobilise financial resources for health in poor countries.[17] Rwanda's scheme—the Mutuelle de Sante, a community-based insurance scheme—has been in place since 1999 and has increased coverage to include all provinces. Figure 3 shows the growth of this scheme, which was 73% of the population in 2006 and continues to grow. Importantly, health-service use has increased greatly from the time when most health care was completely funded by patients. The scheme is run as an autonomous organisation, managed by its members, and helps people to share the risk of having to pay in full for treatment at village and

	2000 baseline	Targets		Latest value (year)
		Vision 2020	MDGs for 2015	
MDG 1: eradicate extreme poverty and hunger				
Poverty (below national poverty line)	60·4%	30·0%	30·2%	56·9% (2006)*
Child (age <5 years) malnutrition (underweight)	24·0%	10·0%	14·5%	22·5 (2006)
Proportion of population below minimum level of dietary energy consumption	41·3%	..	20·7%	36·0% (2006)
MDG 2: achieve universal primary education				
Literacy level (proportion of 15–24 year olds)	74·0%	100·0%	100·0%	76·8% (2006)
Primary school net enrolment	72·0%	100·0%	100·0%	95·0% (2006)
Primary school completion rate	22·0%	100·0%	100·0%	51·7% (2006)
MDG 3: promote sex equality				
Gap between boys and girls in primary education	0	0	0	0 (2005)
Gap in literacy	10·0%	0	0	0·1% (2005)
Seats held by women in parliament	..	50·0%	50·0%	48·8% (2006)
MDG 4: reduce child mortality				
Children (age 11–23 months) immunised against measles	..	100·0%	100·0%	84·0% (2005)
Mortality rate (per 1000 births) of children <5 years	196	50	50	152 (2005)*
Infant (age <1 year) mortality rate (per 1000 births)	107	50	28	86 (2005)*
MDG 5: improve maternal health				
Maternal mortality rate (per 100 000 births)	1071	200	268	750 (2005)
MDG 6: combat AIDS, malaria and other diseases				
HIV prevalence	13·9%	5%	..	3·0% (2005)*
Prevalence of condom use by 15–24-year-olds	4·0%	..	..	39·0% (2005)
Proportion of population aged 15–24 years with comprehensive and correct knowledge of HIV/AIDs	..	..	..	51·0% (girls), 54·0% (boys)
Ratio of school attendance by orphans to school attendance by non-orphans	..	..	..	0·92 (2005)

*On track. Adapted from reference 12.

Table 1: **Summary of the target status of Vision 2020 and indicators of Millennium Development Goals (MDGs).**

at district levels. Boosted by funds from the central government to a cut-off point of $5000, shared between the district and rural health facilities, the scheme provides basic services—ie, family planning, antenatal care, consultations, normal and complicated deliveries, basic laboratory examinations, generic drugs, hospital treatment for malaria, and some tertiary care. In the event of a health disaster, a central reserve fund has been set up. The administrative costs represent 5–8% of the total revenue.[9]

Each member of the insurance scheme contributes 1000 Rwandan Francs ($2) per year and also pays a 10% fee for each illness episode. Decisions relating to the scheme are made through an elected village committee that decides who is too poor to pay. The cost of the insurance scheme for the nominated poor is subsidised by donors. Those with HIV/AIDS (and their families) who are in a PEPFAR programme are excused from paying contributions. Data from 2004 suggest that 10% of the population had their fees waived,[17] although an estimate in 2005 suggested that 15–30% of the poorest population need to have their fees waived.[19]

If the other health insurance schemes—eg, the employment scheme for civil servants (La Rwandaise d'Assurance Maladie) and the Military Medical Insurance were to contribute and reinforce the Mutuelle de Sante scheme, as in the Rwandan government's plan, sharing of risks across the population would greatly improve and result in an improved package of care, including tertiary care.

***Panel 2:* Benefits of improved donor coordination**

- Reduction in number of parallel systems of accounting, procurement, and management
- Less duplication of effort
- Appropriate accountability of health-financing agents
- Reduction in number of inappropriately designed and uncoordinated projects
- Reduction in transaction costs and one-to-one negotiations between Government of Rwanda and partners
- Improved information flow
- Common monitoring and assessment systems

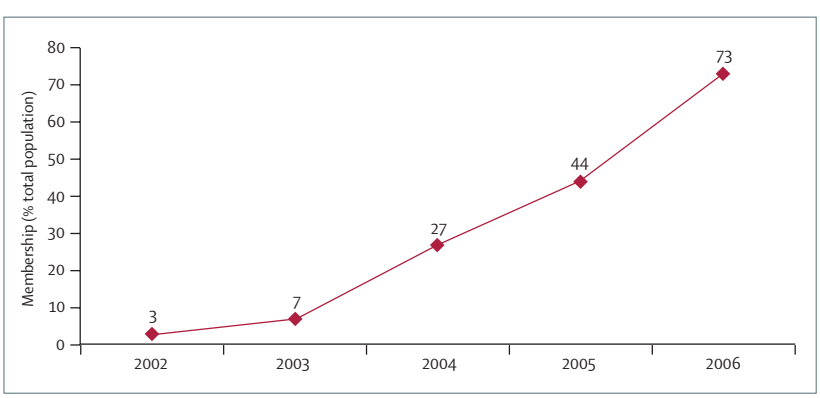

***Figure 3:* Scale-up of community-health insurance scheme**
Reproduced from Basinga and colleagues with permission.[18]

Performance-based pay for health workers

Low staff motivation can lead to non-adherence to guidelines, dangerous practices, or negative attitudes towards patients.[20] The Rwandan government hopes to increase staff motivation and help retain staff through a performance-based pay initiative, introduced in parts of Rwanda in 2001, which is now being scaled-up across the country. This initiative links measurable indicators with financial incentives for health workers who are paid according to their actual performance, rather than fixed bonuses. A technologically advanced health-surveillance system is essential for the implementation of the scheme; the system, which is supported by PEPFAR, involves computerisation of the health centres and district hospitals.

The Ministry of Health in Rwanda successfully piloted the performance-based pay initiative in two districts: first, in Cyangugu in 2001 with the help of Cordaid, a Dutch non-government organisation, which acted as fundholder.[21] Table 2 shows the changes achieved in the delivery of the essential health package indicators between 2003 and 2005. Success was measured as a reduction in fees paid by the patient and an increase in achievement of health needs. A second pilot scheme was undertaken in Butare in 2002. Since 2005, the performance-based pay initiative has been gradually implemented throughout the country, initially in health centres and then in district hospitals. In a comparative study of 16 health centres in four Rwandan provinces, where health worker income was linked to performance, the income was 22·7% higher than that in health centres without a performance-based pay initiative.[8] Health outcomes are also improved; Soeters and colleagues[21] showed that family planning coverage between the former Cyangugu province (with performance-based pay) was 28-fold greater than that in the former Kibungo (without performance-based pay), with a four-fold difference in institutional delivery rates between the two districts. However, the scheme needs reliable methods to verify results and reward providers accordingly. Verification is by contracted district health teams, although random sampling by civil society and grass roots organisations is being piloted to combat fraud or manipulation, and to represent the consumer voice. If feedback about a health centre is negative, the information is then used by the fund holder (and health authorities) during the negotiation of the contract renewals.

Discussion

The Government of Rwanda has shown great commitment to improving health care and accessibility. It now needs a new worldwide aid partnership to achieve the MDGs, with all donors committed to providing aid reliably during a sufficiently long period. Although Rwanda ultimately

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aims to reduce its dependency on aid, it will need, in the medium term, to increase aid flows. For example, a 2007 United Nations Development Programme report suggested that an extra $200 million will be needed each year until 2015 to meet the child survival MDG alone.[3] The Rwandan government needs to increase health spending from the present level of 9·5% of national budget to the 2001 Abuja target (agreed by African governments) of 15% of national budgets for health, and to align development to target the most vulnerable in society.

Hopefully, transparency of budgets, good governance, and the high-level Donors Forum will generate confidence for long-term donor commitment. Donors need to agree to peer review their aid efficiency and reliability. For governments to plan, long-term aid given as budget support is best. However, if increased resources are to be channelled in this way, the capacity of the government is important. Rwanda has dramatically reduced its civil service (now the smallest in Africa) with the aim of reducing operational costs and inefficiency but, as only about 40 officers remain in the Ministry of Health,[14] this might compromise the coordination, planning, budgeting, implementation, and reporting of aid.

More than half of Rwanda's health sector aid comes as project support and is not sufficiently coordinated with government policy or well aligned with the MDGs. High transaction costs and varied donors' agendas confound health planning. For example, $47 million of health aid is spent on HIV/AIDS programmes even though the prevalence is low by sub-Saharan African standards, whereas only $1 million is spent on the Integrated Management of Childhood Illness programme, in a country where one in every seven children dies before the age of 5 years.[14] The difficulty with project aid is that it is short term, unpredictable, and can cause very uneven spread of aid.

Although previously Rwanda lost many health staff as a result of the genocide, now staff are leaving to go to work for international non-government organisations and donor agencies who pay more than the government health service. Internal migration has also resulted in 83% of staff now working in urban areas.[3] Whether performance-based pay will increase salaries sufficiently to reverse this trend and reduce the poaching of health staff remains to be seen. Donors need to reconsider their employment practices to keep wage disparity to a minimum. Performance-based pay by itself will not improve the quality of care and could even distort the delivery of care. For example, targets should include prevention as well as treatment of disease if some aspects of patient care are not to be neglected. Hongoro and McPake[22] call for a careful assessment of performance-based pay in a wide range of settings to assess how workers respond to different incentives. Although performance-based pay is embedded in Rwanda's health policy, with strong political support, it remains to be seen if the skilled public-health doctors and managers needed to negotiate and monitor such contracts are available.

	January, 2003	October, 2005	Difference
Costs incurred per person per year (US$)	9·05 (7·3–10·8)	3·43 (2·5–4·3)	–62%
Episodes with substantial expenditure	2·5% (1·1–3·9)	0·7% (0–1·5)	–72%
Institutional deliveries by skilled individuals	25·0% (15–35)	61·0% (49·0–71·0)	144%
Family planning coverage for women aged 15–49 years	5·4% (3·0–8·0)	11·6% (9·0–14·0)	115%
Unmet demand for family planning	23·0% (19·0–27·0)	11·2% (8·0–14·0)	–51%
Individuals known to be at risk of HIV through skin piercing	35·0% (29·0–41·0)	58·0% (53·0–63·0)	23%

Data are costs (95% CI) or % (95% CI). Adapted from Soeters and colleagues.[8]

Table 2: **Indicators measured during household surveys in Cyangugu province after introduction of performance-based pay initiative**

The community insurance scheme coverage is impressive and generates substantial risk sharing. The increase in use of district health facilities means that families should have improved health and a reduction in the burden of unexpected bills. However, the yearly fee of $2 per person in the population is still expensive for the rural poor, and insufficient to fund comprehensive basic care,[15] which necessitates substantial extra central funding and donor contributions. Addition of contributions from other insurance schemes, as is the Rwandan government's intention, would boost the community insurance greatly. Although exemptions for the poor should improve equity of access,[23] further operational investigation is needed to monitor how well these function in practice, and to identify other barriers to health.[24]

Conclusions

If Rwanda succeeds in achieving improved health coverage through community insurance (with reliable exemptions for the poor) and in retaining health staff through improved pay and incentives, and if it attracts substantial additional aid that is reliable, coordinated with national policy, and sufficiently long term to support the whole of the health system, then these developments would indeed encourage other countries. In Rwanda's favour is a strong government that is interested in making health and equity of access a priority, as it has done already for education. The Ministry of Finance and Ministry of Health are working closely together to deliver the MDGs, and they have good-quality information technology with which to collate health data and follow trends. The Government of Rwanda hopes to eventually shift from donor dependency to self funding but, despite substantial amounts of aid at the moment, the health services remain underfunded and understaffed.

Though much has been achieved by the Government of Rwanda since 1994, major challenges remain. This densely populated country struggles to feed its inhabitants and is situated in an area of continuing geopolitical instability, with all the associated economic

and political uncertainty. However, Rwanda's ambitious plans to improve health deserve recognition for high-level commitment and determination in the face of adversity.

Conflict of interest statement

We declare that we have no conflict of interest.

References

1 Gatete Claver, Rwandan Ambassador to the UK. Post-genocide reconstruction and Development in Rwanda. Address to the International Development Group of the Scottish Parliament. Edinburgh, Scotland, May 24, 2006.

2 Government of Rwanda. Vision 2020. Ministry of Finance and Economic Planning (MINICOFIN) Kigali, Rwanda, 2004.

3 United Nations Development Programme and Government of Rwanda. Turning Vision 2020 into reality. From recovery to sustainable human development. National Human Development Report. United Nations Development Programme and Government of Rwanda, 2007.

4 World Bank. Governance matters 2007. Worldwide governance indicators. Chart for Rwanda available at http://info.worldbank.org/governance/wgi2007/sc_chart.asp (accessed Jan 27, 2008).

5 National Institute for Statistics. Preliminary poverty update report. Integrated living conditions survey 2005/06. Kigali, Rwanda, 2006

6 UNFPA. State of the world's population 2007. Unleashing the potential of urban growth. United Nations Population Fund, 2007. http://www.unfpa.org/swp/2007/presskit/pdf/sowp2007_eng.pdf (accessed Jan 27, 2008).

7 Government of Rwanda. Health sector strategic plan 2005–2009. Ministry of Health (MINISANTE), Kigali, Rwanda.

8 Soeters R, Habineza C, Peerenboom P. Performance based financing and changing the district health system: experience from Rwanda. *Bull World Health Organ* 2006; **84:** 884–89.

9 Kalk A, Kagubare J, Musango L, et al. Paying for health in two Rwandan provinces: financial flows and flaws. *Trop Med Int Health* 2005; **10:** 872–78.

10 Demographic and Health Surveys. Rwanda Demographic and Health Survey 2005 – Final report. Calverton: Demographic and Health Surveys, 2006. http://www.measuredhs.com/pubs/pub_details.cfm?ID=594&ctry_id=35&SrchTp=ctry&flag=sur (accessed Feb 16, 2008).

11 Rwandan Ministry of Health. Health indicators. http://www.moh.gov.rw/health_indicator.html (accessed July 3, 2008).

12 National Institute of Statistic of Rwanda and Ministry of Finance and Economic Planning. Against all odds: Achieving the MDGs in Rwanda: Country Report 2007. Government of Rwanda, Kigali, Rwanda.

13 UNAIDS. 2008 progress reports submitted by country. http://www.unaids.org/en/CountryResponses/Countries/rwanda.asp (accessed Jan 23, 2008).

14 Organisation for Economic Cooperation and Development. Scaling up to achieve the Health MDGs in Rwanda: a background study for the high-level forum meeting in Tunis June 2006. Ministry of Finance and Economic Planning and Ministry of Finance, Government of Rwanda and World Bank, 2006.

15 African Development Bank. Aid, debt relief and development in Africa. African Development Report 2006. Oxford: Oxford University Press, 2006.

16 Organisation for Economic Cooperation and Development. The Paris Declaration on Aid Effectiveness. http://www.oecd.org/dataoecd/11/41/34428351.pdf (accessed Jan 27, 2008).

17 Schmidt J-O, Mayindo J, Kalk, A. Threshold for health insurance in Rwanda: who should pay how much? *Trop Med Int Health* 2006; **11:** 1327–33.

18 Basinga P, Sekabaraga C, Soucat A. Scaling up innovationin services delivery of primary health care: case of Rwanda Prince Mahidol Award Conference; Bangkok, Thailand; Jan 30–Feb 1, 2008.

19 Kalk A, Mayindo JK, Musango L, et al. Paying for Health in Two Rwandan Provinces: financial flows and flaws. *Trop Med Int Health* 2005; **10:** 872–88.

20 Rowe A, de Savigny D, Lanata C, Victora C. How can we achieve and maintain high-quality performance of health workers in low-resources settings? *Lancet* 2005; **366:** 1026–35.

21 Soeters R, Musango L, Meesen B. Comparison of two output based schemes in Butare and Cyangugu provinces with two controlled provinces in Rwanda. Global partnership on Output-Based Aid (GPOBA) World Bank and Ministry of Health, Rwanda, 2005. http://hdptz.esealtd.com/fileadmin/documents/key_sector_Documents/Other_Health_Related_Documents/P4P_feasibility_study_final_8-11-07.pdf (accessed June 30, 2008).

22 Hongoro C, McPake B. How to bridge the gap in human resources for health. *Lancet* 2004; **364:** 1451–56.

23 Brikci N, Philips M. User fees or equity funds in low-income countries. *Lancet* 2007; **369:** 10–11.

24 De Allegri M, Sauerborn R. Community based health insurance in developing countries. *BMJ* 2007; **334:** 1282–83.