

HIV/AIDS Education Management – Meeting the Challenge of Universal Access in Papua New Guinea

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Abstract

In June 2006 at the United Nations General Assembly high-level meeting on Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), United Nations member states agreed to work towards the goal of universal access to comprehensive prevention, care, treatment and support by 2010. One of the key obstacles to scaling-up comprehensive HIV care and treatment in resource limited settings is the lack of appropriately trained health care workers. Experiences with comprehensive HIV care suggest that key factors such as using a team approach, task shifting between health care workers, simplified drug regimes and integrated services have been shown to be integral to the successful provision of comprehensive care. Using Papua New Guinea as a key example, this paper argues that the lack of capacity in health care workers is a key barrier to achieving increased access to comprehensive care in resource limited countries and therefore further research in this area must be seen as a key priority in the response to the HIV epidemic.

Keywords: Papua New Guinea, HIV, resource limited settings, comprehensive care, chronic care

Introduction

The prevalence of Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) worldwide is growing rapidly and at the end of 2004, was globally the leading cause of adult mortality (UNAIDS/WHO, 2006). In June 2006 at the United Nations General Assembly high-level meeting on HIV/AIDS, United Nations member states agreed to work towards the goal of universal access to comprehensive prevention, care, treatment and support by 2010. Advances in treatment and outcome data from the introduction of HIV care and treatment (including antiretroviral therapy - ART) programmes in resource limited settings (Badri, et al., 2006; Laniece, et al., 2003; Levy, et al., 2005; Stringer, et al., 2003; Wools-Kaloustian, et al., 2006) have demonstrated that the goal of providing comprehensive HIV prevention, treatment and care (including ART) (hereinafter referred to as 'Comprehensive Care') can be successfully implemented in resource limited settings.

Along with this realization has also come the debate about who should provide this care (Glazier et al., 2002; Kober & Damme, 2004; Wendo, 2005; Wilson et al., 2005). Glazier et al. (2002, p.1) concludes that 'regardless of this debate, it is generally accepted that health care providers must have detailed knowledge about HIV and AIDS if they are to provide the best care for their patients'. Despite the obviousness of this statement and the fact that that overwhelmingly the burden of HIV is on resource limited countries, there is a dearth of published research on what training is appropriate for registered nurses in these settings to enable them to effectively provide Comprehensive Care.

One of the key obstacles to scaling-up levels of client care to Comprehensive Care in resource limited settings is the lack of appropriately trained health care workers (Hanson et al., 2003; Hirschhorn et al., 2006). Despite human resources being variously described as 'the heart of the health system' and 'the most important aspect of the health care system', human resource development has received little, if any attention, in the development of health care systems in resource limited countries (Hongoro & McPake, 2004). Scaling up to the provision of Comprehensive Care will require a cadre of appropriately trained health care workers, and in the case of resource limited countries, this implicitly implies nurses (Ranson et al., 2003). Nowhere is this truer than in Papua New Guinea where the physician to nurse ratio is one of the lowest in the developing world - 0.09 (WHO, 2007).

Perspectives on health systems and HIV/AIDS

After a century of the most spectacular health advances in human history, we are confronting unprecedented and interlocking health crises. We face rising death rates and plummeting life expectancy in some of the world's poorest countries and new global pandemics that threaten us all...Today's crisis reflects both new and resurgent diseases as well as neglect of human resources in the health sector, so critical for effective response [sic]. (Joint Learning Initiative, 2004, p.1)

The shortage of human resources has been described as one of the most important bottlenecks to the scaling up comprehensive HIV care and treatment (Ranson et al., 2003; Wyss et al., 2003). The Commission on Macroeconomics and Health argued that scaling up interventions for key health conditions that are responsible for the lion's burden of avoidable mortality in developing countries are among the greatest challenges facing health systems in these countries. One of the key challenges is the shortage of appropriately trained health care workers (Ranson et al., 2003).

Malfunctioning health care systems and the HIV epidemic itself combine to create one of the greatest obstacles to resource limited countries scaling up comprehensive HIV care and treatment. HIV poses a new and unique threat to the ability of health care systems to deal effectively with health crises as it increases the workload and the required skill of health care workers; adds

considerably to the psychosocial stress that health care workers have to endure due to the increasing number of sick and dying patients, and as the prevalence of HIV increases in a community, it has the potential to reduce the number of available health workers and therefore further weaken the health care system (Michaud, 2003). In order to more effectively manage the challenges of HIV/AIDS, countries need to focus on strengthening their health systems, and in particularly their human resources (Ranson et al., 2003; Wyss et al., 2003).

Ensuring the appropriate preparation of health care workers is integral to the strengthening of health care systems. In order to be effective at doing this, health training infrastructure needs to have a clear understanding of the issues, challenges and opportunities that face contemporary health care workers and to develop appropriate strategies to address these (Kachur & Krajić, 2005).

Hanson (2000) argues that a key prerequisite to health system strengthening and to scaling up priority health care services is the need to decentralise decision making and service delivery. Hanson (2000) further argues that decentralisation can provide for greater opportunities for innovation and community participation and 'moves services to the people rather than people to the services'. Khalenghian (2003), supporting Hanson, states that both of these attributes are believed to be associated with greater success in implementation (Khaleghian, 2003).

Models of health care

Effective care for chronic conditions cannot be delivered however unless there are adequately trained health care workers. While the world experiences a transition from acute to chronic health problems, the educational preparation of health care workers continues largely utilizing an acute, biomedical care model focus (Pruitt & Jordan, 2005). There is growing recognition of the limitations of this educational model in terms of preparing a 21st century health care workforce (WHO, 2002b).

Experiences with Comprehensive HIV Care suggest that a multifaceted approach is the most likely to be beneficial. Actively involving patients in their health care decisions, provision of appropriate supports and educational programmes to teach skills to the patient to enhance the benefits of Comprehensive Care, and tailoring Comprehensive care to meet each patient's individual needs has been demonstrated to be effective (Chesney, 2000; Chesney et al., 2000).

One attempt to address this deficiency in educational preparation is the World Health Organization's (WHO) competencies for delivering effective health care for patients with chronic conditions (WHO, 2005). These competencies are:

1. Patient centred care,
2. Partnering
3. Quality improvement

4. Information and communication technology, and
5. Public health perspective

It is suggested that these five core competencies should underpin the educational preparation of all health care workers who provide care for patients with chronic conditions. These competencies have been endorsed by several influential professional bodies, including the International Council of Nurses and the International Alliance of Patients' Organizations but are yet to be translated into reality (Pruitt & Jordan, 2005).

Chronic care model

Chronic diseases currently account for more than half of the global disease burden and are one of the primary challenges facing a 21st century health care system (WHO, 2004c). This prioritisation is vastly different from the health care systems of the 20th century where acute problems, such as infectious diseases were paramount.

Health care for chronic conditions inherently is different from health care for acute problems, and in this regard, current health care systems worldwide fall remarkably short. Health care systems have not kept pace with the decline in acute health problems and the increase in chronic conditions. (Pruitt, S. et al., 2002, p. 32)

Chronic diseases can be defined as 'Diseases which have one or more of the following characteristics: they are permanent, leave residual disability, are caused by non-reversible pathological alteration, require special training of the patient for rehabilitation, or may be expected to require a long period of supervision, observation or care' (WHO, 2003, p. 4).

Increasingly, there is a view among public health experts that HIV/AIDS is a chronic condition which requires comprehensive care in no different a manner to many non-communicable diseases such as Ischaemic Heart Disease and Diabetes (Pruitt et al., 2002; WHO, 2003). In sub-Saharan Africa, a recent examination of the burden of disease revealed that 86% of disability adjusted life years (DALYs) were because of non-communicable diseases of which HIV/AIDS contributed significantly (Setel et al., 2004).

Resource limited countries suffer the greatest impact from major chronic conditions. Of the total number of deaths attributable to non-communicable diseases worldwide, 77% are estimated to occur in developing countries (WHO, 2004c), while approximately half of all health services required in resource limited countries are for chronic conditions (Kitahata et al., 2002). Despite these statistics most health care systems remain oriented to the management of acute illness. The patient's role in their own care is not emphasized or supported; follow up of treatment is sporadic, and prevention is usually neglected (Pruitt et al., 2002). As a result many people are failing to receive appropriate care despite the evidence that including patients in decision

making and treatment planning makes the delivery of care for chronic conditions more effective and more efficient (Holman & Lorig, 2000; Schonlau et al., 2005; Tsai et al., 2005; Vladeck, 2001).

Setel et al. (2004) argue that for both public health and services planning reasons, it is imperative that we move away from a model of health care delivery that has a narrow focus on acute episodic care to one that more closely reflects the burden of chronic disease, regardless of the etiology. Vladeck (2001) in supporting this view argues that the three major constraints to improving care for chronically ill people are health care provider behaviour, organizational barriers and public policy.

As chronic conditions by definition are enduring, it is essential that care strategies are developed with patients, health care workers and health care organizations as partners. The Innovative Care for Chronic Conditions (ICCC) framework is one such model. This framework, based upon the Chronic Care Model (CCM), 'expands community and policy aspects of improving health care for chronic conditions and includes components at the micro (patient and family), meso (healthcare organization and community), and macro (policy) levels.' (Epping-Jordan et al., 2004, p. 299)

The Chronic Care Model was developed from clinical experience and documented evidence regarding mechanisms that facilitated improved care in patients with chronic conditions (Wagner et al., 2001). The CCM encompasses a holistic approach to the patient, aims to involve patients and their families in improving outcomes, focuses on improving outcomes rather than procedures, and promotes and encourages task shifting within members of the health care team (Cretin et al., 2004). Provider roles and standards of care and treatment are explicit and based on a synthesis of evidence from clinical trials and studies. A systematic review of these studies by the Cochrane Effective Practice and Organization of Care group suggests a synergistic effect when individual interventions are combined, and a recent review of the literature confirms this and highlights the consistency between the most successful chronic care improvement strategies and the concepts and components that underpin the CCM (Bodenheimer et al., 2002; Renders et al., 2001; Schonlau et al., 2005).

In a meta-analysis undertaken by Tsai et al. (2005, p. 487), the introduction of just one component of the CCM such as the care delivery system or self-management support resulted in an improvement in clinical outcomes but, consistent with the findings of Grol and Grimshaw (1999), interventions with multiple components had a much greater effect which they interpreted as arising from a 'synergistic effect in which the whole is bigger than the sum of the parts'. They concluded that chronic care that included at least one element of the CCM improved clinical outcomes and processes of care and to a lesser extent, the quality of life for patients with chronic conditions (Tsai et al., 2005). While these studies investigated chronic care in resource rich countries, Swartz and Dick (2005) argue that the need for the implementation of the CCM

components in countries where needs are great and resources scarce is even more imperative.

While conceptually linked to the CCM, the ICCC framework extends the CCM dyad of informed activated patients and prepared proactive teams to a triad through the inclusion of community partners. This inclusion emphasizes the critical role that the communities play in health systems in many resource limited settings and recognizes that the best chronic care is delivered when all members of the 'team' communicate and collaborate with each other. A further change in the ICCC framework is the movement away from 'informed and activated' to 'informed, motivated and prepared'. This change reflects the reality that in many resource limited settings it is insufficient to be motivated if you have inadequate knowledge (either through not being informed or not being trained) and/or resources (Epping-Jordan et al., 2004).

Integrated management of adult and adolescent illness (IMAI)

While the translation of the WHO five core competencies into pre-service health care worker education is yet to be realized, in-service training of health workers utilizing the ICCC framework as a base has begun and has shown some promising results. One of these programmes is the Integrated Management of Adult and Adolescent Illness Chronic HIV Care (IMAI). IMAI is a strategy to improve the quality of health care for under-served populations in resource limited settings (WHO, 2006).

IMAI builds on and complements previous experience with other integrated approaches such as the Integrated Management of Childhood Illness (IMCI). It extends the integrated management of common clinical conditions to the relatively neglected adolescent and adult groups, including the elderly. Within this life span approach, IMAI responds to the need for more and better health care in these age groups resulting from the increasing burden of disease due to chronic conditions and the high prevalence of HIV/AIDS in many resource limited countries. IMAI is designed to better meet the health care needs of adolescents and adults, through improved case management, disease prevention and health promotion (WHO, 2006).

Two key aspects of the IMAI approach is the integration of prevention and care activities and task shifting. Integration within the approach is seen as key to ensuring the optimal use of resources, an increased usage of HIV services, and the improvement of the lives of those infected and affected by HIV (Kitahata et al., 2002; Wilson et al., 2005). Equally task shifting is seen as essential for resource limited countries if Comprehensive Care is to be achieved. In the main this outcome will mean shifting tasks traditionally performed by physicians to nurses. Despite the resistance and reluctance to such an approach by many established health care workers (Berwick, D. M., 2004), initiatives to date have demonstrated the safety and success of such an approach (Venning et al., 2000; Wendo, 2005; Wilson et al., 2005).

One small study conducted in a Philadelphia HIV Ambulatory Care Center to evaluate patient satisfaction with a range of aspects of care specific to HIV found that while HIV patients rated the overall care of the centre as good, nurse practitioners fared more favourably than physicians in areas related to clinic waiting times, provider knowledge about the disease, continuity of care and patient education even though nurse practitioners consistently cared for a larger number of HIV-positive patients compared with the physicians (Lagner & Hutelmyer, 1995).

This study's findings are consistent with the findings of a systematic review of nurse practitioners undertaken by Horrocks et al. (2002). As a result of inconsistency in the use of the title nurse practitioner, the review used a criteria for inclusion of 'studies where nurses provided the first point of contact, made an initial assessment, and managed patients autonomously, whether or not they were described as nurse practitioners.' (Horrocks et al., 2002, p. 819) Their study found overall that increasing the availability of nurse practitioners in primary care is likely to lead to high levels of patient satisfaction and high quality care. While none of the 11 trials or 23 observational studies specifically examined HIV care, it is arguable that the results could equally be extrapolated to the care an appropriately educated nurse could deliver to HIV patients.

Kitahata et al. (2002) believe task shifting provides a solution to successful scale up of Comprehensive Care in resource limited settings.

Training primary care providers to deliver some aspects of HIV care, and developing effective communications and referral systems to closely link primary providers to more specialized services could begin to address the need for HIV expertise in resource poor settings. (Kitahata et al., 2002, p. 956)

Evaluation studies of the effectiveness of task shifting are however limited. One study in the US reported findings from six training projects designed to keep health care providers up to date on developments in HIV/AIDS care found that a health care providers background '...does not necessarily provide diagnostic evidence as to who might most benefit (in terms of improved confidence in caring for clients and training topics) from HIV/AIDS educational training' (Panther et al., 2000, p. 613).

The development of IMAI resulted from a working partnership involving WHO, Geneva, the WHO Regional Office for Africa (AFRO), and various international collaborating institutions including the Centre for Disease Control, Columbia University, Harvard Medical School, London School of Hygiene and Tropical Medicine and the MacFarlane Burnett Institute for Medical Research and Public Health. IMAI utilizes a 'horizontal' approach, already well developed with programmes such as IMCI, with the integration of specialized 'vertical' programmes input in the development of simplified tools to help improve health care in resource limited settings.

While no evaluation has yet been undertaken of the IMAI program, research has been undertaken into the cost effectiveness and efficacy of the Integrated Management of Childhood Illness (IMCI) program. IMCI has shown an improved quality of care outcome for children in resource limited settings (Gouws et al., 2004; Oluwole et al., 2000) although concerns have been expressed about the costs of implementing the program (Khan et al., 2000).

In contrast to these concerns, a Tanzanian study conducted in 1999 demonstrated that health care costs per child in IMCI districts were 44% lower than in non IMCI districts. This difference was attributed to a reduction in hospitalization of children cared for in IMCI districts and reduced administrative costs. The lower administrative costs resulted from a reduction in transportation costs for medicines and general supervision (Taghreed et al., 2005). While not related to the study objective, one of the key outcomes noted was the strengthening of the health care system that had occurred with the implementation of IMCI. The authors of the study note that while the results should only be interpreted as estimating the costs of IMCI due to several variables affecting the study, the study did not find any evidence that IMCI resulted in higher health care costs than routine care.

Regarding quality of care, studies in Brazil and Uganda demonstrated that children treated by a health care worker who had received IMCI training were more likely to be prescribed the correct antimicrobial care, to have been administered the first dose at the health facility, and to have their caregivers instructed in the child's continuing care needs (Gouws et al., 2004). Given the results of the Tanzanian study and the evidence of the impact and outcomes of IMCI training for clients, Taghreed et al. (2005) encouraged the continue implementation of IMCI in Tanzania.

While no formal evaluation studies have been undertaken of the effectiveness of IMAI, anecdotal evidence from Uganda attributes the country's success in facilitating large scale increase in the level of Comprehensive Care given to people living with HIV/AIDS to the IMAI strategy (Wendo, 2005). The development of teams of health care workers, task shifting and the use of people living with HIV/AIDS to train and evaluate health care workers was seen as some of the key benefits of using this model (Wendo, 2005).

Horizontal versus vertical approach

One of the key issues in the expansion of access to priority health services, such as Comprehensive Care, in resource limited settings is how best to implement efforts to scale up services. The Commission on Macroeconomics and Health (CMH) in 2002 argue that the best way to deliver priority health interventions was through the use of 'the-close-to-client' (CTC) health system (WHO, 2002a). This health system consists predominantly of district hospitals and health centres staffed mostly by nurses, midwives and other community health workers. The report also identified that these existing low-level health facilities would need significant strengthening to meet this task.

These CTC systems provide care predominantly through vertical or categorical programmes. These programmes are designed to address a particular disease or condition and are largely not integrated within the regular infrastructure of the health care system. An example of these programmes is malaria, with the most notable successful vertical program being the global smallpox eradication program (Hanson K et al., 2003; Oliveira-Cruz et al., 2003b).

In contrast, horizontal approaches (also referred to as integrated health services or programmes) to health care delivery utilize the regular infrastructure of the health care system. A key example of a horizontal approach is the primary health care model that emphasizes the importance of service integration (Oliveira-Cruz et al., 2003b). It is argued that this more holistic approach to health which centred on the needs of individual communities, promotes appropriate inter-sectoral, political and community participation and is therefore more successful (Mills, 1983). Critics of the horizontal approach however argue that issues such as low morale of staff, lack of skills, and an overwhelming burden of responsibilities experienced by staff can lead to the ineffectiveness of integrated health services (Oliveira-Cruz et al., 2003b).

One of the greatest criticisms of the vertical approach to service delivery is that due to its narrow approach, focusing on one disease, it does not contribute to the strengthening of the overall health care system and may indeed weaken these systems through the diversion of health care workers time and attention away from other priorities (Conn et al., 1996). Concerns have also been expressed about the potential for vertical programmes to weaken community self reliance and their failure to take into account diversity among countries and hence often adopting a 'one model fits all' approach (Banerji, 1999).

In a review of the integration of health services, WHO identified that despite numerous vertical programmes such as the control programmes for HIV, diarrheal diseases, malaria, leprosy and tuberculosis, there had been little improvement in the health status of the population in Ghana (1996). Reports from Tanzania and Zaire also observed that measles vaccination programmes failed to reduce under 5 mortality, due to malaria and other causes of mortality which were not targeted by the programme (WHO, 1996).

Conversely, proponents of the vertical approach highlight the benefits that health care systems derive from vertical programmes such as the ability to focus on disadvantaged populations while promoting a 'culture of prevention'. Successful initiatives that have used a vertical approach are the Polio Eradication Initiative and the promotion of donor coordination through the programmes such as the Expanded Program for Immunization (Gounder, 1998; Oliveira-Cruz et al., 2003b).

Oliveira-Cruz et al. (2003b) note that the paucity of evidence in this area is such that either approach could not be recommended as a panacea. They suggest that individual circumstances of each resource limited country should be considered and an approach tailored to fit the particular needs of that country. In conclusion they propose that 'expanding access to priority health

services requires the concerted use of both vertical and horizontal approaches, in accordance with the capacity of health systems as [they] change over time.' (Oliveira-Cruz et al., 2003b, p. 83)

Briggs et al. (2001) in their review of the effect of integrating primary health services in middle and low-income countries arrived at the same conclusion. They found that there was no consistent pattern of benefit in integration, and in two of the studies integration resulted in negative outputs in comparison with vertical programmes. They however noted that their review was limited in that only four studies of good quality were included in the review. They concluded by suggesting that policy makers could introduce strategies to allow further evaluation of integration projections so as to increase the evidence base on the effectiveness or otherwise of integration.

One of the key risks in integration in resource limited settings is that resources may be spread so thinly that health activities fail to meet even the minimum standard required to achieve any impact on health. Hanson (2000) identified these and notes that below a certain resource level, the outputs of an integrated health system is likely to be lower than a vertically based health programme.

Given the chronic nature of the disease, people living with HIV/AIDS will need a greater range of services over a longer period of time. Therefore the argument for integration of health services, and specifically for comprehensive HIV care and treatment to be integrated within the current health care system, is suggested to be strong particularly given that a lack of integration has been implicated as the cause of problems such as 'lost to follow-up', failure of service delivery and less than optimal outcomes (Brodsky et al., 2003).

Implementing a model of Comprehensive Care

In addition to humanitarian considerations, there is a growing body of evidence and consensus that identifies the treatment of HIV-infected persons as having a positive effect on HIV prevention which in turn assists with minimizing the negative socio-economic effects of the HIV epidemic in that prevention and care are inextricably linked (Lamprey & Wilson, 2005). Concentrating on prevention alone is inadequate and cannot penetrate the inertia and sense of hopelessness that accompanies constant death and dying (Berkman, 2001).

In resource limited settings with already poorly functioning public health systems, care for HIV-infected patients has not been considered a priority. As a result, minimal effort has been made in improving the capacity of staff to cope with demands of providing HIV care and often non-government organisations (NGO) and faith based organisations (FBO) have been left to provide stop gap measures (Creese et al., 2002). Coupled with this lack of prioritization, many communities where Comprehensive Care is needed already suffer from a lack of health care workers to provide basic health care services (Buve et al., 2003).

Access to Comprehensive Care in resource limited countries has seen significant improvements in prognosis for those people living with HIV/AIDS.

Despite these advances and the successes associated with providing Comprehensive Care in resource limited countries (Badri M et al., 2006; Levy et al., 2005; Moatti et al., 2004; Wools-Kaloustian et al., 2006), few of the people living with HIV/AIDS in resource limited settings receive such care (Mukherjee et al., 2003). Buve et al. (2003) succinctly enunciate the paramount rationale for scaling-up Comprehensive Care.

HIV/AIDS programmes of prevention and care, if well integrated in public health services, can contribute to the strengthening of health systems. Especially programmes to improve care of HIV-infected patients can restore the confidence of communities in the health services and boost the morale of health staff which may have beneficial effects on other activities as well...With training and the provision of supplies necessary to manage HIV-related morbidity health staff might again be motivated, as their sense of achieving something may improve. (Buve et al., 2003, p. S48 & S49)

Key factors that have been identified as being integral to the successful provision of Comprehensive Care in resource limited settings include using a team approach, task shifting between health care workers, simplified drug regimes and integrated services – evidence for these four priorities is included in table 1:

Table 1: Four key factors in the provision of comprehensive care in resource limited settings

1. Successful Comprehensive Care programmes are based on a team approach.	People living with HIV/AIDS are key members of the team. Patients reap benefits of ‘more eyes and ears...and the insights of different bodies of knowledge, and a wider range of skills.’ (Wagner et al., 2001; WHO, 2004a)
2. Task shifting or skills substitution between health care workers.	This strategy is viewed as practical, feasible and effective means to meeting human resource skill shortages. (Hongoro & McPake, 2004; Kitahata et al., 2002; WHO, 2004b)
3. Simplification of treatment regimes and the use of fixed dose combinations (FDCs).	Managing ARV drug regimes in this way makes prescribing easier and facilitates increased compliance and adherence. (WHO, 2004b)
4. Integration and coordination of services.	All health care services including prevention, testing and treatment and psychosocial support need to be integrated within the current health system at community level. (Lamphey & Wilson, 2005; WHO, 2004a, 2004b)

Conclusion

Both pre-service and in-service education and training remain valuable tools for facilitating the scaling up of Comprehensive Care, but not all knowledge, practices and procedures are transferable from one setting to another. To facilitate good and sustainable patient outcomes, training needs to be underpinned by a program that ensures in-depth knowledge and skills and which takes account of the local context.

While there is considerable research in relation to the effectiveness of anti-retroviral therapy in resource limited settings, there is a paucity of evidence as to the effectiveness of the various models of training used to prepare health care workers to provide Comprehensive Care. As the lack of capacity in health care workers is a key barrier to achieving increased access to Comprehensive Care in Papua New Guinea, research aimed at identifying the effectiveness of the IMAI Chronic HIV Care training program in preparing Papua New Guinean registered nurses to provide Comprehensive HIV care is currently being conducted. The outcomes of this research are seen as critical in facilitating the sustained scale-up of HIV Care and Treatment in PNG.

References

- Badri, M., Maartens, G., Mandalia, S., Bekker, L., Penrod, J.R., Platt, R.W. 2006, Cost-effectiveness of highly active antiretroviral therapy in South Africa, *PLoS Medicine*, 3(1), 0048-0056.
- Banerji, D. 1999, Political context of the work of international agencies, a fundamental shift in the approach to international health by WHO, UNICEF and the World Bank: instances of the practice of 'intellectual fascism' and totalitarianism in some Asian countries, *International Journal of Health Services*, 29(2), 227-259.
- Berkman, A. 2001, Confronting global AIDS: prevention and treatment, *American Journal of Public Health*, 91(9), 1348-1349.
- Berwick, D.M. 2004, Lessons from developing nations on improving health care, *British Medical Journal*, 328, 1124-1129.
- Bodenheimer, T., Wagner, E.H. & Grumbach, K. 2002, Improving primary care for patients with chronic illness: the chronic care model, part 2, *JAMA*, 288(15), 1909-1914.
- Briggs, C., Capdegelle, P., & Garner, P. 2001, Strategies for integrating primary health services in middle and low-income countries: effects on performance, costs and patient outcomes (review): The Cochrane Database of Systematic Reviews.
- Brodsky, J., Habib, J. & Hirschfield, M. 2003, *Key Policy Issues in Long-Term Care*, World Health Organization, Geneva.
- Buve, A., Kalibala, S. & McIntyre, J. 2003, Stronger health systems for more effective HIV/AIDS prevention and care, *International Journal of Health Planning and Management*, 18, S41 - S51.
- Chesney, M. 2000, Factors affecting adherence to antiretroviral therapy, *Clinical Infectious Diseases*, 30, S171-176.

- Chesney, M., Morin, M. & Sherr, L. 2000, Adherence to HIV combination therapy, *Social Science and Medicine*, 50, 1599-1605.
- Conn, C.P., Jenkins, P. & Touray, S.O. 1996, Strengthening health management: experience of district teams in The Gambia, *Health Policy and Planning*, 11(1), 64 - 71.
- Creese, A., Floyd, K., Alban, A. & Guinness, L. 2002, Cost-effectiveness of HIV/AIDS interventions in Africa: a systematic review of the evidence, *The Lancet*, 359, 1635-1642.
- Cretin, S., Shortell, S.M. & Keeler, E.B. 2004, An evaluation of collaborative interventions to improve chronic illness care, *Evaluation Review*, 28(1), 28-51.
- Epping-Jordan, J.E., Pruitt, S.D., Bengoa, R. & Wagner, E.H. 2004, Improving the quality of health care for chronic conditions, *Quality and Safety in Health Care*, 13, 299-305.
- Glazier, R.H., Rackal, J.M., Tynan, A.M., Iacona, S. & Handford, F. 2002, Provider training and experience for people living with HIV/AIDS (Protocol): The Cochrane Database of Systematic Reviews, Issue 3. Art. No. CD003938. DOI: 10.1002/14651858.CD003938.
- Gounder, C. 1998, The progress of the polio eradication initiative: what prospects for eradicating measles? *Health Policy and Planning*, 13(3), 212 - 233.
- Gouws, E., Bryce, J., Habicht, J.P., Amaral, J., Pariyo, G. & Schellenber, J.A. 2004, Improving antimicrobial use among health workers in first level facilities: results from the multi-country evaluation of the integrated management of childhood illness strategy, *Bulletin of the World Health Organization*, 82(7), 509-515.
- Grol, R. & Grimshaw, J.M. 1999, Evidence-based implementation of evidence-based medicine, *Joint Commission Journal on Quality Improvement*, 25(10), 503-513.
- Hanson K, Ranson M K, Oliveira-Cruz V, & A.M. 2003, Expanding access to priority health interventions: a framework for understanding the constraints to scaling-up, *Journal of International Development*, 15, 1-14.
- Hanson, S. 2000, Health sector reform and STD/AIDS control in resource poor settings - the case of Tanzania, *International Journal of Health Planning and Management*, 15, 341-360.
- Hirschhorn L.R., Oguda L., Fullem A., Dreesch, N. 2006, Estimating health workforce needs for antiretroviral therapy in resource-limited settings, *Human Resources for Health*, 4(1), 1-25.
- Holman, M., & Lorig, K. 2000, Patients as partners in managing chronic disease, *British Medical Journal*, 320, 526-527.
- Hongoro, C. & McPake, B. 2004, How to bridge the gap in human resources for health, *The Lancet*, 364, 1451-1456.
- Horrocks, S., Anderson, E. & Salisbury, C. 2002, Systematic review of whether nurse practitioners working in primary care can provide equivalent care to doctors, *British Medical Journal*, 324, 819-823.
- Kachur, D. & Krajic, L. 2005, Structures and trends in health profession education in Europe, in C.A. Dubois, M. McKee & E. Nolte (Eds), *Human Resources for Health in Europe*, European Observatory on Health Systems and Policies, Brussels.

- Khaleghian, P. 2003, *Decentralization and Public Services: the Case for Immunization*, (research working paper No. 2989), World Bank, Washington DC.
- Khan, M.M., Ahmed, S. & Saha, K.K. 2000, Implementing IMCI in a developing country: estimating the need for additional health workers in Bangladesh, *Human Resources for Health*, 4, 73-82.
- Kitahata, M.M., Tegger, M.K., Wagner, E.H. & Holmes, K.K. 2002, Comprehensive health care for people infected with HIV in developing countries, *British Medical Journal*, 325, 954-957.
- Kober, K. & Damme, W.V. 2004, Scaling up access to antiretroviral treatment in Southern Africa: Who will do the job? *The Lancet*, 364, 103-107.
- Lagner, S. & Hutelmyer, C. 1995, Patient satisfaction with outpatient human immunodeficiency virus care as delivered by nurse practitioners and physicians, *Holistic Nursing Practice*, 10(1), 54 - 60.
- Lamprey, P. & Wilson, D. 2005, Scaling up AIDS treatment: What is the potential impact and what are the risks? *PLoS Medicine*, 2(2), 0102 - 0104.
- Laniece, I., Ciss, M., Desclaux, A., Diop, K., Mbodj, F. & Ndiaye, B. 2003, Adherence to HAART and its principal determinants in a cohort of Senegalese adults, *AIDS*, 17(Suppl. 3), S103-S108.
- Levy, N.C., Miksad, R.A. & Fein, O.T. 2005, From treatment to prevention: the interplay between HIV/AIDS treatment availability and HIV/AIDS prevention programming in Khayelitsha, South Africa, *Journal of Urban Health*, 82(3), 498-509.
- Michaud, C. 2003, *Development Assistance for Health: Recent Trends and Resource Allocation*, World Health Organization, Geneva.
- Mills, A. 1983, Vertical vs. horizontal health programmes in Africa: idealism, pragmatism, resources and efficiency, *Social Sciences and Medicine*, 17(24), 1971-1981.
- Moatti, J.P., Spire, B. & Kazatchkine, M. 2004, Drug resistance and adherence to HIV/AIDS antiretroviral treatment: against a double standard between the North and the South, *AIDS*, 18 (suppl. 3), S55-S61.
- Mukherjee, J.S., Farmer, P.E., Niyizonkiza, D., McCorkle, L., Vanderwerker, C. & Teixeira, P. 2003, Tackling HIV in resource poor countries, *British Medical Journal*, 327, 1104-1106.
- Oliveira-Cruz, V., Kurowski, C. & Mills, A. 2003b, Delivery of Priority health services: searching for synergies within the vertical versus horizontal debate, *Journal of International Development*, 15, 67-86.
- Oluwole, D., Mason, E. & Costello, A. 2000, Management of childhood illness in Africa: early evaluations show promising results, *British Medical Journal*, 320, (594-595).
- Panther, A., Huba, G., Melchior, L., Anderson, D., Driscoll, M. & Rowheder, C. 2000, Healthcare provider characteristics and perceived confidence from HIV/AIDS education, *AIDS Patient Care*, 14(11), 603-614.
- Pruitt, S., Annandale, S., Epping-Jordan, J., Diaz, J.F., Khan, M. & Kisa, A. 2002, *Innovative Care for Chronic Conditions: Building Blocks for Action*, World Health Organization, Geneva.
- Pruitt, S. D. & Jordan, J.E.E. 2005, Preparing the 21st century global healthcare workforce, *British Medical Journal*, 330, 637-639.

- Ranson, M. K., Hanson, K., Oliveira-Cruz, V. & Mills, A. 2003, Constraints to expanding access to health interventions: an empirical analysis and country typology, *Journal of International Development*, 15, 15-39.
- Renders, C.M., Valk, G.D., Griffin, S., Wagner, E.H., vanEeijk, J.T.M. & Assendelft, W.J.J. 2001, Interventions to improve the management of diabetes mellitus in primary care outpatient and community settings: Cochrane Review, in *The Cochrane Library*, Issue 2, 2001, Update Software, Oxford.
- Schonlau, M., Mangione-Smith, R., Chan, K., Keesey, J., Rosen, M. & Louis, T. 2005, Evaluation of a quality improvement collaborative in asthma care: does it improve processes and outcomes of care, *Annals of Family Medicine*, 3(3), 200-208.
- Setel, P., Saker, L., Unwin, N., Hemed, Y., Whiting, D. & Kitange, H. 2004, Is it time to reassess the categorization of disease burdens in low-income countries, *American Journal of Public Health*, 94(3), 384-388.
- Setel, P., Saker, L., Unwin, N.C., & Smith, I. 2004, Is it time to reassess the categorization of disease burdens in low-income countries? *American Journal of Public Health*, 94(3), 384-388.
- Stringer, E.M., Sinkala, M., Stringer, J.S., Mzyece, E., Makuka, I., & Goldenberg, R.L. 2003, Prevention of mother-to-child transmission of HIV in Africa: successes and challenges in scaling-up a nevirapine based program in Lusaka, Zambia, *AIDS*, 17, 1377-1382.
- Swartz, L. & Dick, J. 2005, Managing chronic diseases in less developed countries, *British Medical Journal*, 325, 914-915.
- Taghreed, A., Manzi, F., Schellenberg, J.A., Mgalula, L., deSavigny, D. & Evans, D.B. 2005, Does the integrated management of childhood illness cost more than routine care? Results for the United Republic of Tanzania, *Bulletin of the World Health Organization*, 83(5), 369-377.
- Tsai, A., Morton, S., Mangione, C., & Keeler, E. 2005, A meta-analysis of interventions to improve care for chronic illnesses, *The American Journal of Managed Care*, August, 478-488.
- UNAIDS/WHO 2006, Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO): UNAIDS/WHO.
- Venning, P., Durie, A., Roland, M., Roberts, C. & Leese, B. 2000, Randomised controlled trial comparing cost effectiveness of general practitioners and nurse practitioners in primary care, *British Medical Journal*, 320, 1048-1053.
- Vladeck, B. 2001, You can't get there from here: obstacles to improving care of the chronically ill, *Health Affairs*, 20(6), 175-179.
- Wagner, E.H., Austin, B.T., Davis, C., Hindmarsh, M., Schaefer, J. & Bonomi, A.E. 2001, Improving chronic illness care: translating evidence into action, *Health Affairs*, 20(6), 64 - 78.
- Wendo, C. 2005, Uganda leads the way in innovative HIV/AIDS treatment, *Bulletin of the World Health Organization*, 83(4), 244-245.
- WHO 1996, *Integration of Health Care Delivery*, World Health Organization, Geneva.
- WHO 2002a, *Commission on Macroeconomics and Health, Improving Health Outcomes of the Poor, Report of Working Group 5*, World Health Organization, Geneva.

- WHO 2002b, *Human Resources and National Health Systems, Shaping the Agenda for Action*, World Health Organization, Geneva.
- WHO 2003, *Adherence to Long-Term Therapies: Evidence for Action*, World Health Organization, Geneva.
- WHO 2004a, *Academic Institutions Linking Access to Treatment and Prevention*, World Health Organization, Geneva.
- WHO 2004b, *Antiretroviral Therapy in Primary Health Care: Experience of the Chiradzulu Programme in Malawi*, World Health Organization, Geneva.
- WHO 2004c, *World Health Report*, World Health Organization, Geneva.
- WHO 2005, *Preparing a Workforce for the 21st century: the Challenge of Chronic Conditions*, World Health Organization, Geneva.
- WHO 2006, *Integrated approaches to HIV Care, ART and Prevention: IMAI and IMCI tools*, World Health Organization, Geneva.
- WHO. 2007, *Country Health Information Profile - Papua New Guinea*, World Health Organization, Manila
- Wilson, I.B., Landon, B.E., Hirschhorn, L.R., McInnes, K., Ding, L. & Marsden, P.V. 2005, Quality of HIV care provided by nurse practitioners, physician assistants and physicians, *Annals of Internal Medicine*, 143(10), 729-736.
- Wools-Kaloustian, K., Kimaiyo, S., Diero, L., Siika, A., Sidle, J. & Yiannoutsos, C.T. 2006, Viability and effectiveness of large-scale HIV treatment initiatives in sub-Saharan Africa: experiences from Western Kenya, *AIDS*, 20, 41-48.
- Wyss, K., Moto, D.D., & Callewaert, B. 2003, Constraints to scaling up health related interventions: the case of Chad, Central Africa., *Journal of International Development*, 15, 87-100.

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