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# Understanding the magnitude of occupational exposure to human immunodeficiency virus (HIV) and uptake of HIV post-exposure prophylaxis among healthcare workers in a rural district in Tanzania

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## SUMMARY

**Background:** Occupational exposure to blood or other body fluids in healthcare settings puts healthcare workers (HCWs) at risk of acquiring human immunodeficiency virus (HIV) infection. It is estimated that between 200 and 5000 HIV infections are transmitted annually to HCWs worldwide. Use of post-exposure prophylaxis (PEP) has been documented to reduce the rate of HIV infection from workplace exposures by 81%.

**Aim:** To investigate the extent of occupational exposure to HIV infection during the period of 12 months before the survey and to identify factors associated with uptake of PEP services among HCWs.

**Methods:** We interviewed 221 HCWs from selected healthcare facilities in Kongwa, Tanzania. Data included occupational exposures to body fluids, knowledge and use of PEP.

**Findings:** Sixty (27.1%) of the HCWs had experienced exposures to blood and body fluids, of whom 71.7% (43/60) had needlestick injuries. Medical attendants were more frequently exposed, followed by nurses (31.7% and 28.6% respectively). Of the exposed HCWs, seven (11.7%) reported use of HIV PEP. Reporting of exposure [odds ratio (OR): 8.44;  $P = 0.016$ ], knowledge of the HIV status of the source patient (OR: 42.19;  $P = 0.007$ ) and awareness of PEP (OR: 12.72;  $P = 0.010$ ) were significant predictors of PEP use.

**Conclusion:** Uptake of PEP services among HCWs remains low despite high rate of occupational exposures. Wider dissemination of HIV PEP guidelines and training of HCWs is required in Tanzania to ensure that HCWs have knowledge of, and prompt access to, PEP services.

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## Introduction

Three million percutaneous exposures to bloodborne pathogens occur annually among 35 million healthcare workers (HCWs) worldwide, and it is estimated that 2.5% of human immunodeficiency virus (HIV) infections in HCWs are attributable to occupational sharps exposures.<sup>1</sup> In addition, HCWs are at risk of acquiring HIV infection through splashes of contaminated

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blood or body fluids.<sup>2</sup> In total, 4% of HIV infections among HCWs result from professional exposures; 90% of these occur in low-income countries and are preventable.<sup>3</sup>

The risk of occupational bloodborne infections for HCWs in low-income countries is exacerbated by a range of factors, such as health facility overcrowding; lower ratios of HCWs to patients; limited awareness of the risks associated with exposure to blood and other body fluids; failure to implement universal precautions; inadequate supplies of basic safety equipment; and the need to handle contaminated needles and other sharps that are processed for reuse. Furthermore, lack of reliable access to HIV post-exposure prophylaxis (PEP) increases the chances of this infection developing after occupational exposure.

The high prevalence of HIV infection in some low-income countries puts HCWs in these countries at particular risk. The Tanzania HIV/Malaria Indicator Survey of 2011/2012 revealed a high HIV prevalence (5.1%) among sexually active persons aged 15–49 years. As the prevalence of HIV infection continues to rise, HCWs will be exposed to an increasing number of contacts with patients with HIV/acquired immune deficiency syndrome (AIDS).<sup>4</sup> The situation in rural settings may be compounded by inadequate numbers of HCWs and shortage of equipment. Data from Kongwa (Figure 1) indicate an HIV/AIDS prevalence of 2.8% among men and women aged 15–49 years in the general population; and that HIV-related conditions are among the ten most prevalent diseases. However, there are wide variations within the district, with the HIV prevalence being as high as 8.3% at Kibaigwa Health Centre.

The global response to the escalating occupational exposure to HIV among HCWs included publication of the International Labour Organization (ILO) Code of Practice on HIV/AIDS in 2001 followed by the Joint ILO/World Health Organization Guidelines on health services and HIV/AIDS in 2005.<sup>5,6</sup> The Ministry of Health in Tanzania responded to these publications by developing HIV PEP guidelines which state that any exposed HCW should be able to access services within the same facility. Where on-site services are not available, a local PEP facilitator (a staff member specifically tasked with keeping records of exposures, and giving guidance to exposed HCWs) refers the exposed person to the nearest facility. However, time to reach the referral facility and access PEP varies widely, depending on the time of the day, availability of public transport and geographical terrain. Post-exposure management entails management of exposure site, assessment of infection risk, administration of PEP where indicated, follow-up, and counselling. PEP drugs should be provided within 2 h and not later than 72 h after exposure. For low-risk HIV exposures, a combination of Zidovudine and Lamivudine is used, whereas for high-risk exposures triple combination therapy is recommended, e.g. Zidovudine + Lamivudine + Efavirenz®, or Lopinavir + Ritonavir®.

In these guidelines it is emphasized that any HCW exposed to or infected with HIV occupationally shall be entitled to PEP, or treatment in the case of HIV infection. Facility-level implementation started in 2005 with training of HCWs and appointment of PEP facilitators.



Figure 1. Map of Tanzania showing relative position of Kongwa district in Dodoma region.

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