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Infection control in countries with limited resources

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Infection control (IC) in countries with limited resources potentially affects healthcare in all countries; infectious diseases have spread around the globe very efficiently but infection prevention has lagged behind. Control of healthcare-associated infections (HAIs) is one of the great successes: it reduces illness and mortality and saves money for patients and hospitals. Yet, today only 57 of 192 countries have national IC societies and there is still no global planning for managing this plague which is largely preventable, and which spawns a host of related problems including multidrug-resistant organisms and bloodborne infections among patients and healthcare workers (HCWs). In fact, infection problems continue to be amplified in hospitals rather than reduced. For example, the Severe Acute Respiratory Syndrome (SARS) began as a community-acquired, severe respiratory disease but ultimately, almost half of cases were due to hospital transmission.

Global health constraints that affect infection prevention include insufficient financial resources for healthcare in general, failure of facilities to use proven prevention strategies, and inadequate training for HCWs, especially nurses; a disproportionate burden falls on the least developed facilities. There is such a major failure in terms of global planning that the essential nature and function of infection control programmes are virtually invisible. To emphasise the positive aspects however, rates for HAIs in ICUs are reported by Rosenthal and others to be 3–4 times the benchmark National Nosocomial Infections Study (NNIS) in the USA, but these fall to the benchmark when surveillance data is provided to HCWs in sufficient detail. In the USA, two very large infection prevention projects, “Keystone Project” and “100,000 Lives Campaign” have reported precipitous declines in HAIs when proven strategies are implemented.

Activities related to infection risk reduction, and global health planning that includes appropriate antibiotic use, preventing transmission of bloodborne pathogens are essential.

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Healthcare-associated infection affects hundreds of millions of people worldwide in developed,
transitional, and developing countries and is a major, global issue for patient safety. It complicates a significant proportion of patient care deliveries, adds to the burden of resource use, and contributes to unexpected deaths. Whether acquired during home, ambulatory, institutional or hospital care, healthcare-associated infections (HAIs) constitute one of the greatest challenges of today’s medicine. According to the Institute of Medicine, hospital-related adverse events in the USA, including HAIs, are responsible for 44,000 to 98,000 deaths annually and represent a cost of $17–29 billion. Among these, HAIs now affect 5–15 per 100 hospitalized patients and can lead to complications in 25–50% of those admitted to intensive care units. In the United Kingdom, HAIs cost around £1 billion a year and contribute to at least 5000 deaths. Importantly, these estimates only concern infections acquired in acute-care hospitals and take no account of those resulting from ambulatory care or acquired in other settings. Infection rates are higher in transitional and developing countries than in developed countries. Worldwide, HAIs affect as many as 1.4 million patients at any point in time in healthcare institutions.

The World Health Organization (WHO) supported the creation of an international alliance to improve patient safety as a global initiative, and the World Alliance for Patient Safety was launched in October 2004. The six actions areas of the Alliance are: Patients for Patient Safety; Taxonomy; Research; Solutions for Patient Safety; Reporting and Learning; and a biennial Global Patient Safety Challenge. HAI is the topic chosen for the first Challenge, covering 2005–2006, and the First Global Patient Safety Challenge “Clean Care is Safer Care” was launched in October 2005.

The First Global Patient Safety Challenge embraces existing WHO strategies to reduce HAI and also creates the momentum for new actions to improve hand hygiene during patient care. The major objectives of “Clean Care is Safer Care” are: to raise awareness of the impact of HAI on patient safety and promote preventive strategies within countries; to build commitment from countries to prioritise reducing HAI; and to test the implementation of the new WHO Guidelines on Hand Hygiene in Health Care in specific areas worldwide as part of an integrated package of actions derived from existing WHO strategies in the fields of blood safety, injection and immunisation safety, clinical procedure safety, and water, basic sanitation and waste management.

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Antibiotic resistance continues to pose an ever-increasing threat to effective healthcare delivery. This is more so in developing and low-resource countries and in facilities where financial limitations add another dimension to the problem. Developing countries often face a burden from multi-resistant infections that is even greater than that in more affluent nations. Such infections constitute an even higher monetary burden and the average cost for a single multi-resistant infection can be equivalent to the gross national income per capita. Furthermore, restricted availability of antibiotics may result in inadequate therapeutic options.

Despite its relevance, knowledge about the status of antibiotic resistance in the developing world remains on the whole lacking, as a result of inadequate emphasis on research and surveillance. However, recent studies suggest that the situation in developing countries is often more acute than that already reported in the west. In particular, meticillin-resistant *Staphylococcus aureus* (MRSA) has possibly become the major resistant pathogen, particularly in hospitals and healthcare institutions and resistance. Equally serious are the ever increasing reports of extended-spectrum β-lactamase (ESBL)-producing Enterobacteriaceae, especially *Escherichia coli*, where prevalence in excess of 50% has been reported from middle eastern countries.

The efforts required in order to address this ever increasing problem within low-resource countries resemble those required to address the same problem in their more developed equivalents and focus primarily on prevention and control of cross-transmission together with improved antibiotic stewardship. However it is in these efforts that developing countries may encounter greater and at times insurmountable obstacles. Not uncommonly health systems in these regions are curative-orientated with the result that the funds, personnel and training required for preventive efforts are difficult to obtain.

However, progress appears to have been made in the past years as more hospitals in these nations now report having infection control committees in place. Infection control teams, composed of designated and trained infection control doctors and infection control nurses, and which are widely regarded as the cornerstone of an effective IC programme, are however less common and this situation constitutes a potential drawback which often hampers outcome. A need for improved
training of IC personnel is another critical issue. Whilst it may be simple for infection control committees (ICCs) to be set up within hospitals, these require an effector mechanism to produce the most appropriate recommendations and to ensure that clinical staff take responsibility for these and put them into practice. This has been reported to be particularly relevant in developing countries where nurses, doctors and patients may be less aware of the importance of IC and its relevance to safe healthcare.

The causal link between antibiotic resistance and consumption has been well established. Studies have documented parallel changes in antimicrobial usage and in the prevalence of antimicrobial resistance. Recent data suggest there is a significant consumption of antimicrobials in developing countries, which may be a factor contributing to the high prevalence of resistance. Mathematical modeling suggests that, in environments where there is both a high prevalence of antimicrobial resistance as well as evidence of considerable antibiotic consumption, the area of improvement that is likely to have the biggest impact on resistance is control of antibiotic use. Such improvement can be obtained through antibiotic stewardship programmes, which aim to ensure that the use of antibiotics – particularly in hospitals – is commensurate with the clinical circumstances and the local resistance epidemiology. To this end, feedback to prescribers of local antimicrobial resistance information, as well as the development and dissemination of antibiotic prescribing guidelines based on the local circumstances, are critical interventions that will have a major impact in combatting the documented high prevalence of antimicrobial resistance in the low resource countries.

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Injection safety refers to practices that reduce the risk of transmission of bloodborne viruses (BBVs) to patients and providers. Although transmission of BBVs occurs in healthcare facilities, the true extent is unknown but thought to be highly variable in facilities with limited resources. Most of the risk to HCWs and to patients can be prevented.

As part of the Year 2000 Global Burden of Disease study, the WHO quantified death and disability from injection-associated infections with hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). In the year 2000, in 10 regions that included developing countries only, it was reported that persons visiting a general practitioner received an average of 3.4 injections per year, 39.3% of which were given with reused equipment. In the same year, contaminated injections caused an estimated 21 million HBV infections, two million HCV infections and 260,000 HIV infections, accounting for 32%, 40% and 5%, respectively, of new infections. Many studies have documented that HCWs lack knowledge about safe practices, risk for transmission and waste management.

Injection overuse and unsafe practices account for a substantial burden of death and disability worldwide. There is a need for policies and plans for the safe and appropriate use of injections in countries where practices are poor.