

# Success in the South Pacific: a case study of successful diffusion of an infection prevention and control program

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**Abstract.** *Introduction:* The aim of this study was to explore the role of the Diffusion of Innovations framework in adopting an infection prevention and control program (IPCP) in a low and middle income (LMI) country, the Republic of Kiribati.

*Methods:* Case-study methodology was used to examine and contextualise the analysis of the Republic of Kiribati's adoption of the IPCP from 2003 to 2010. Data were collected from multiple sources including semi-structured interviews, IPCP documentation, program evaluation and a healthcare worker survey. Data were subjected to thematic analysis and descriptive statistics where relevant to the study design.

*Results:* It was found that the self-initiated progression of activities and stimuli has resulted in the successful adoption of a comprehensive IPCP. The process followed the staged model of the classic Diffusion of Innovations process in organisations described by Everett Rogers.

*Conclusion:* This case study provides an illustration of how a comprehensive IPCP can be adopted in a LMI country setting with little involvement from external agencies. It identifies key stimuli, opportunities and activities which could be similarly adopted and implemented by other LMI countries.

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## Introduction

Prevention and control of healthcare-associated infections (HAI) is an increasingly important element in the provision of health services globally. It relates to not only protecting those accessing health services from the spread of infectious or pathogenic disease but also protecting healthcare workers, their families, and other persons associated with health services. This is of particular concern in low and middle income (LMI) countries where there are minimal infection control guidelines, infrastructure, policy directives or persons responsible for establishing, implementing and monitoring infection control programs.

An infection prevention and control program (IPCP) is a collection or cluster of activities, resources, policies and procedures designed to control and prevent the transmission of infectious diseases within the healthcare environment.<sup>1</sup> The core components of an IPCP are individual but inter-related, collectively comprising a specific innovation package. Core

components of an IPCP have been categorised by the World Health Organization (WHO) as:

- organisation of IPCP
- technical guidelines
- human resources
- surveillance of infections and assessment of compliance with infection prevention and control practices
- microbiology laboratory support
- environmental minimum requirements
- monitoring and evaluation of programs
- links with public health or other relevant services.<sup>2</sup>

The efficacy of infection control programs in reducing the incidence of HAI has been well established in the literature, particularly in developed or high income countries.<sup>3,4</sup> These infection control programs are informed by evidence-based guidelines and advice developed by internationally recognised health authorities such as the United States Centers for Disease Control and Prevention (CDC) and the WHO.

### Implications

- Diffusion of Innovations is a model that can be successfully used in the adoption of comprehensive infection prevention and control programs in the low and middle income country setting.
- An event such as a worldwide infectious disease outbreak can be an important impetus to identify gaps in health service provision, providing an opportunity for growth.

Based on such advice, many countries, including resource-limited or LMI countries, attempt to establish infection control programs with varying degrees of success.<sup>5–7</sup> From the experience of the first author it appears that the standards set by these guidelines and advice are unachievable due to resource limitations, lack of engagement of healthcare workers and health authorities, lack of expertise, and institutional and priority competition.

The Republic of Kiribati appears to be an exception to these general findings and experience. In 2003, the first author visited Kiribati during a severe acute respiratory syndrome (SARS) rapid preparedness assessment of infection prevention and control capacity. The assessment found limited infection prevention and control programming and activities. Kiribati was visited again in 2005 to review infection prevention and control capacity. This 2005 review found evidence of significant improvements in the overall program, increased activities and what appeared to be genuine enthusiasm for infection prevention and control. A progressive adoption of infection prevention and control activities was evident and it appeared that a comprehensive program would result. The extent of these changes was not typical of other LMI countries in the region.

### The Republic of Kiribati

The Republic of Kiribati is a central western Pacific country of 33 atolls and reef islands in three main island groups, the Gilbert, Phoenix and Line Islands. Kiribati has a total land mass of 811 km<sup>2</sup> spread over 3.5 million kilometres of ocean. It has a population of ~100 000 and an annual population growth rate of 1.7%. The most populated islands are South Tarawa, North Tarawa and Kiritimati Island with urban growth rates of 5.2%, 4.8% and 8% respectively.<sup>8</sup> Compared with most other Pacific islanders, I-Kiribati have a short life expectancy of 65 years for males and 70 years for females.<sup>8</sup>

The health system of Kiribati is publicly funded with government spending \$13.45 million USD in 2008, primarily on curative services, pharmaceuticals and staffing.<sup>8</sup> Significant technical and financial assistance is provided to the Ministry of Health by development partners.<sup>9</sup> The formal health system is administered by the central Ministry of Health. Traditional healers provide a parallel service offering local medicines, massage, antenatal, childbirth and postnatal

care. Most people use both services though there is no coordination between them.<sup>8</sup> Primary health care is provided through a network of 92 health centres and dispensaries. Basic hospital services are available at South Tarawa (Betio), Kiritimati Island and North Tabiteuea. Secondary care is provided by the 130-bed national referral hospital, Tungaru Central Hospital in South Tarawa. Acute-care services include surgery, obstetrics, paediatrics, internal medicine, special-care nursery and tuberculosis treatment. Patients requiring tertiary-care services may be referred overseas for treatment if they meet the criteria defined by the Ministry of Health.

The healthcare workforce is made up of both locally and internationally trained individuals. The chain of command is hierarchical, with a top-down approach to decision-making, though evidence of collaboration and co-operation is evident in the structure and activities of various committees, particularly the Infection Control Committee. Senior staff and directors are seen as the decision-makers within the system as they hold positions of influence based upon their skills, experience and expertise.

### The study: exploration of the Kiribati case

Exploring and identifying the process of successful IPCP adoption is important to assist other countries in their adoption and implementation of IPCPs. This is particularly salient where LMI countries are relying on guidance established for use in well resourced settings, which often provides them with a poor practical fit.<sup>10</sup> To gain a greater understanding of this process of adoption, further exploration of the key elements and stages of the process itself is required, not just whether selected key components are in place.

A theoretical framework which is appropriate for conducting an exploration of these key elements and stages is the classic Diffusion of Innovations theory. Classic Diffusion of Innovations theory describes ‘...the process by which an innovation is communicated through certain channels over time among the members of a social system’ (p. 5).<sup>11</sup> Diffusion of innovations theory has its roots firmly embedded in agriculture and geography. The concepts central to this theory were first described in the 1930s by researchers studying the adoption of hybrid corn in farming. Whilst observing the process they noticed patterns of communication and influence amongst farmers.<sup>12</sup> Since then Everett Rogers has been primarily responsible for the scholarly development of diffusion of innovations theory.<sup>11,13–16</sup> Other scholars who have contributed significantly to the development of the theory include Brown, Downs, Mohr, Tornatzky and Fleischer.<sup>17–19</sup>

The classic diffusion of innovations theory as it relates to organisations provides a framework through which the adoption of IPCPs can be examined. In every diffusion research study, program or campaign, four key elements are always present:<sup>1</sup> an innovation,<sup>2</sup> communication channels,<sup>3</sup> time, and<sup>4</sup> a social system.<sup>11,13,14</sup> These elements inform the process, whether for an individual or for an organisation. It is

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