

# Subsector Analysis (Summary): Hospital Hygiene and Infection Prevention and Control

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## **CURRENCY EQUIVALENTS**

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Currency unit	–	togrog (MNT)
MNT1.00	=	\$0.000723
\$1.00	=	MNT1,384

## **ABBREVIATIONS**

CSSD	–	Central Sterilization Service Department
HAI	–	hospital acquired infection
HCW	–	health care worker
ICP	–	infection control practitioner
IPC	–	infection prevention and control
WHO	–	World Health Organization

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## **SUBSECTOR ANALYSIS (SUMMARY): HOSPITAL HYGIENE AND INFECTION PREVENTION AND CONTROL**

### **A. Framework**

1. The legal framework for infection prevention and control (IPC) is Order 165 which was issued in 2010, consisting of both administrative and technical framework. It was intended to provide comprehensive administrative and technical guidelines that includes essential aspects related to IPC, among others, organization, roles and responsibilities of IPC committee/sub-committee; infection control precautions; disinfection and sterilization instructions; diagnostic criteria for hospital acquired infection (HAI); list of single-use disposable items; surveillance reporting forms for HAI.

2. Order 165 is complemented by a number of orders and standards that are relevant to IPC, including waste management orders; blood safety orders; Order 397 on care of tuberculosis patients; standard of HAIs surveillance (MNS 59856-2003); standard of resistant pathogens (MNS 5948-57-2003).

3. The General Agency for Specialized Inspection is responsible for external evaluation of the hospitals' quality of services, in which the scope of inspection encompasses the hygiene and infection control of health care facilities. The current inspection checklist audits on the availability of organization and plan for IPC activities; hand hygiene commodity, guideline and training; medical waste management; essential facilities and sterilization equipment; surveillance of resistant microorganisms; staff vaccination coverage and infection prevention plan for health care workers (HCW), etc.

4. The financial system of the Mongolian health sector is based on the budget line for each expenditure item. Funding for IPC consumable is under the budget line of "Drug" which covers budget for drugs and medical devices including disposable items, reagents, and disinfectants. Inclusion of a dedicated budget line for detergents and/or disinfectants is currently under review and will be approved soon. Budget for other IPC activities such as IPC training and research is under the overall hospital budget, and is subject to the availability of budget as well as the priority given.

5. Individual hospitals are responsible for maintenance of hospital equipment. The nature of equipment maintenance services is largely corrective and/or involves repair works that are often provided by in-house maintenance or outsourced from other hospitals. Budget for equipment maintenance is under the overall maintenance budget which also covers building and building services maintenance.

### **B. Key Issues**

#### **1. Hospital Acquired Infections Worldwide**

6. HAI is recognized as the most frequent adverse event in health care, yet the global burden remains unknown because of difficulties in gathering reliable data. In many health care settings, HAI appears to be a hidden, cross-cutting problem that no institution or country can claim to have solved yet. Literature review of national or multicenter studies published from 1995 to 2008 showed the overall prevalence of HAI in developed countries varies between 5.1% and 11.6%. Only 23 of 147 developing countries reported a functioning national surveillance system in a survey conducted by the World Health Organization (WHO) First Global Patient

Safety Challenge. Studies conducted in health care settings in developing countries reported hospital-wide HAI rates markedly higher than those in developed countries.

7. The burden of HAI is much more severe in high-risk populations such as adults in critical care and neonates, with overall infection rates and device associated infection rates several times higher in developed countries. Surgical site infection represents the most frequent type of HAI in low- and middle-income countries and more than 10% of operated patients usually develop a surgical site infection.

8. Based on the available evidence, the impact of HAI implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, massive additional financial burden for health systems, high costs for patients and their family, and unnecessary deaths. To prevent infections, control measures including hand hygiene is simple, low cost, and effective; however, this requires staff accountability and behavioral change.

## 2. Hospital Acquired Infections in Mongolia

9. As compared to the internationally reported rate, the reported HAI prevalence in Mongolia is substantially lower. HAI reported officially to the central level in 2011 totals 85 cases, which included both public and private health care facilities. The reported HAI prevalence ranged from 0.01% to 0.05% of all hospital admissions, with the highest prevalence (0.05%) reported by tertiary hospitals in Ulaanbaatar. In contrast, a 1-day prevalence study piloted at two tertiary hospitals in Ulaanbaatar showed that 5.4% of the 933 patients surveyed were diagnosed with HAI. This pilot indicates considerable underreporting of HAI.<sup>1</sup>

10. Though this prevalence study showed a substantially higher HAI prevalence at the tertiary hospitals as compared to the official data (5.4% versus 0.05%), the figure is still much lower than the rates found in other developing countries (prevalence ranged from 5% to 19%, with most studies reported a value higher than 10%). Although there might be variations between the tertiary hospitals in Mongolia and other developing countries, 5.4% is still a conservative estimate, considering the high usage of antibiotics in Mongolian hospitals.

## 3. Current Situation Related to the World Health Organization's Outline of Core Components for Infection Prevention and Control Programs<sup>2</sup>

11. **Organization of infection prevention and control in public facilities.** The current hospital infection control system was established in 1997 with the adoption of infection control policies and guidelines, establishment of hospital infection control programs in all major hospitals, training of health professionals, and the commencement of passive surveillance of HAI.<sup>3</sup> However, IPC often receives insufficient priority and the national IPC strategies and plans are in many cases not implemented.

12. **Budget for infection prevention and control.** As mentioned earlier, there is no dedicated budget line for IPC; budget for other IPC activities such as training and research are

<sup>1</sup> Ider, B. E., Clements, A., Adams, J., Whitby, M. & Muugolog, T. 2010. Prevalence of hospital-acquired infections and antibiotic use in two tertiary Mongolian hospitals. *Journal of hospital infection*, 75, 214-9. Epub 2010 Apr 1

<sup>2</sup> WHO outlines that there are eight core components for infection prevention and control programs: organization, technical guidelines, human resources, surveillance, microbiology laboratory, environment, monitoring, and evaluation.

<sup>3</sup> Ider, B. E., Clements, A., Adams, J., Whitby, M. & Muugolog, T. 2010. Organization of hospital infection control in Mongolia. *Journal of hospital infection*, 75, 209-13.

under the overall hospital budget which is subject to the availability of funding as well as the priority of hospital management.

13. **Technical guidelines.** There are a number of national technical standards and guidelines for IPC. The issues concerning the guidelines are that some of the practices are outdated and that user guides are not available. For example, guidelines still include the use of formalin as disinfectant (which should be discontinued), sterilization of mattresses (which could be replaced with more efficient and effective measure); there is no explanation for the various criteria (criteria 1 to 4) listed for diagnosing HAI. In addition, standards and guidelines have not been consolidated into one single document or series, which might result in inconsistent recommendations.

14. **Human resources.** Since 1997 tertiary and secondary level hospitals have been obliged to have one full time infection control practitioner (ICP). Since the end of last decade, hospitals are obliged to have one full time ICP for every 250 beds. Some hospitals with 300 beds have employed a second ICP and several *aimag* (province) hospitals employed an assistant ICP. Most of the ICPs are hygienist-epidemiologists by training. In general, there is limited training opportunity for ICPs.

15. **Training.** The ICP is responsible for providing in-service training for hospital staff; common topics include prevention of HAIs, medical waste management, and use of disinfectants. The current undergraduate training curricula for medical students only include treatment of infectious diseases and an IPC module is not included. The Health Sciences University meanwhile is in the process of incorporating an IPC training module for undergraduates, which will consist of a 2-hour theoretical session introducing basic terminologies related to IPC, and a 4-hour practical session which comprises primarily of case studies. The adequacy of this new IPC module for undergraduate training remains questionable.

16. **Seroprevalence and sharps injury among health care workers.** A study conducted in 2010 showed that 42.4% of 354 primary, secondary and tertiary HCWs in Ulaanbaatar were found to have at least one infection. Hepatitis B Virus was the most common infection. The same study showed that around 87% of the HCWs had been injured by sharps and the frequency was higher among nurses as compared to physicians and housekeepers. There is limited data on knowledge, attitude, and practices of HCWs on sharps injury in Mongolia. Studies conducted so far focused only on Ulaanbaatar hospitals. Knowledge, attitude, and practices of HCWs in other provinces on sharps injury are not known.

17. **National health care workers immunization program.** The national HCWs vaccination program against HBV in Mongolia started in 2010 and priority is given to high risk HCW working in operating theatres, obstetrics and gynecology, dental, and laboratory departments. Immunization policies for influenza have also been introduced for HCWs working in high risk areas. Progress of HBV vaccination for HCWs has slowed down by lack of funding. Furthermore, antibody test is not done after the third dose of HBV vaccination. The 2010 study also showed that only 3 out of 41 vaccinated HCWs had effective vaccination (anti-HBs positive), and the remaining 38 vaccinated HCWs did not have effective vaccination (anti-HBs negative).<sup>4</sup> As the Ministry of Health is campaigning on HBV vaccination for HCWs, it is optimistic that the coverage for vaccination will improve in near future. The crucial point is to

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<sup>4</sup> Khosbayar, T. & Otgonbayar, B. 2010. The study of sharps injury among health care workers. (Supported by WHO, Yonsei University Korea and Health Sciences University Mongolia).

ensure that these vaccinations are effective, and remain effective throughout the HCWs' in-service years.

18. **Surveillance and reporting of hospital acquired infections.** Surveillance of HAI largely depends on passive surveillance where HAIs are notified by the hospitals. Active surveillance carried out by the ICPs of the Health Related Infection Surveillance and Research Unit of the National Centre for Communicable Diseases are mainly conducted at few city hospitals due to limited resources. The unit also conducts retrospective investigations of patient records to detect hepatitis B and hepatitis C viral infections at the National Centre for Communicable Diseases. There is a general consensus that HAIs are underreported in post-Soviet Bloc countries, including Mongolia. Punitive performance evaluation by the Ministry of Health and penalization of hospitals and staff when HAIs have been detected are factors that have contributed to underreporting of HAIs. This has resulted in deliberate underreporting of HAIs in Mongolian hospitals.

19. **Microbiology lab support.** Several district hospitals in Ulaanbaatar are without a microbiology laboratory. Laboratories of the secondary hospitals commonly lack essential equipment and reagents/consumables. Lab samples and reagents are stored in domestic refrigerators and autoclaves are often outdated and performance not validated. It was found that microbiological investigations were documented for 18.9% of the surveyed patients although 59.8% of the patients were taking antibiotics, and 92.1% of the patients were prescribed antibiotics without sensitivity test. In addition, laboratory diagnosis for multi-drugs resistant organisms is limited in Mongolia, mainly due to lack of awareness on comprehensive antibiotic susceptibility testing, systematic approach for identification of resistant organisms, and inconsistent supply of consumables. Though the standard operating procedures for laboratories are available, these standard operating procedures should be reviewed and updated.

20. **Environment.** The effort in promoting hand hygiene has improved the awareness on the use of alcohol-based hand-rub in hospitals, although the constant availability of this commodity still needs to be improved. Hand basins are generally available at the point of patient care. None have elbow-operated tap. Patient placement is inadequate due to limited space in the inpatient departments. Many wards are not able to maintain the recommended spacing of 1-2 meters between beds. Inpatient facilities with isolation rooms have dedicated hand basin at the anteroom. However, the isolation patient room tends to stock-up supplies of essential drugs, consumables and equipment which will be used for subsequent patients, contradicting the principles of isolation precaution. Overall environment within the hospitals is reasonably clean but cleaning is carried out with no proper cleaning equipment. The common disinfectants use is chloramine or sodium hypochlorite solution. Visited hospitals did not have "dirty utility rooms" in the inpatient departments.

21. **Monitoring and evaluation.** IPC related indicators consist only of the single indicator of HAI rate. There are no process indicators in place. Apart from that, routine internal evaluation has not been carried out in hospitals, due to lack of awareness, supervision and audit tools. External evaluation are conducted by the General Agency for Specialized Inspection following Order 165, and may result in outdated advices (for example, use of formalin as an disinfectant has not been banned; continuation of mattresses streaming that is not validated instead of simpler and effective measure for mattresses disinfection).

#### 4. **Sterilization\_of Surgical Instruments and Medical Devices**

22. Centralized versus in-house Central Sterilization Service Department (CSSD): CSSDs are commonly found in all tertiary hospitals, most of the secondary hospitals and some primary health care facilities. Health care facilities without CSSD receive support for sterilization from other nearby facilities. The Ministry of Health suggests establishing a “centralized” CSSD to serve primary and secondary health care facilities as well as private hospitals or clinics without a CSSD in Ulaanbaatar. However, analysis showed that benefits of the proposed initiative are not evidenced.

23. CSSDs visited during the survey are in need of minor civil works to improve the overall conditions and building services. Visited CSSDs are equipped with basic equipment; however none have washers/disinfectors, ultrasonic washers or low-temperature sterilizers. Sterilization process is affected by budget availability which determines the choice of disinfectants. Instruments checking and maintenance is not done; packing is poor. On the whole, the sterilization processes needs to be strengthened.

## **5. Maintenance**

24. Maintenance is generally carried-out by the in-house staff. Hospitals without biomedical maintenance staff often contracted the maintenance services of tertiary hospitals in Ulaanbaatar. Common issues encountered in maintenance are lack of spare-parts, preventive maintenance and skills in dealing with new equipment.

## **C. Key Challenges**

25. The gap analysis on IPC highlighted the need for strengthening multiple areas ranging from review and consolidation of policies and guidelines, training, infrastructure and equipment improvement. This requires the application of a multi-pronged approach consisting of technical assistance and upgrading of infrastructure and equipment. Key challenges that need to be addressed for IPC are:

- (i) Microbiology laboratories needs to be strengthened, in particular:
  - (a) the practice and procedure for comprehensive antimicrobial susceptibility testing that is essential for analysis of antimicrobial resistance; and
  - (b) the need to assess and monitor the adherence of microbiology laboratories to national biosafety standards.
- (ii) Basic infrastructure and equipment, in particular, CSSDs and hand hygiene facilities have to be enhanced. In order to enhance the sustainability of the investment, it is equally important to institutionalize a better maintenance culture that emphasizes on prevention maintenance.
- (iii) A new HAI surveillance system that suits the local context needs to be developed and scaled-up progressively. The new system should consider introduction of periodic surveillance for selected HAI(s) which should be first piloted before implementation and expansion of surveillance sites.
- (iv) Strengthening IPC necessitates improving the knowledge and competency of the health care professional in IPC related subjects such as staff protection as well as technical knowledge and skill. These necessitate:
  - (a) consolidation of policies and technical guidelines which will be the platform for regulatory development;
  - (b) emphasis on IPC training which should encompass both in-service and pre-service training. Institutionalization of adequacy and effective IPC training module at undergraduate level is critical, and thus, the need to review and revise the curricula for undergraduates; and

- (c) formulation and implementation of communication activities for behaviour change among the health care personnel.
- (v) Successful quality assurance for IPC must:
  - (a) ensure adoption of appropriate indicators in the regulatory framework that should include both updated process and outcome indicators; and
  - (b) include the practice of both internal and external quality assurance, and thus, the involvement of hospital management as well as the General Agency for Specialised Inspection.
- (vi) Building up IPC requires a concerted effort in securing adequate finance resources to ensure sustainability. As the first step, the hospitals need to estimate recurrent costs for IPC related consumable to advocate for adequate recurrent budget for IPC measures.