

A RAPID ASSESSMENT OF INJECTION PRACTICES IN MONGOLIA, 2001

Sophie LOGEZ, pharmD, DESS, (1) G Soyolgerel, MD (2), Rebecca Fields (3), Steve Luby (4) and
Yvan Hutin, MD, MSc (1)

(1) World Health Organization, Geneva, Switzerland

(2) Minister of Health of Mongolia, Ministry of Health, Ulaanbaatar, Mongolia.

(3) Project CHANGE, Academy for Educational Development, Washington DC, USA

(4) Centers for Disease Control and Prevention, Atlanta, GA, USA

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Address for correspondence:

Dr Yvan Hutin

Department of Blood Safety and Clinical Technology,

World Health Organization,

Avenue Appia 20, CH 1211,

Geneva,

Switzerland

Tel: +41 (22) 791 3431

Fax: +41 (22) 791 4836,

E-mail: sign@who.int

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ABSTRACT

Background

Anecdotal reports of unsafe practices and a high prevalence of HCV infection suggest that poor use of injections may transmit bloodborne pathogens in Mongolia. To achieve safe and appropriate use of injections, the Ministry of Health of Mongolia conducted a rapid assessment.

Methods

Information on injection practices, their determinants and their consequences was collected through interviews and observations of a convenience sample of prescribers, injection providers and members of the general population.

Results

The 65 members of the general population reported receiving an average of 13 injections per year. New, locally produced, disposable injection equipment was used in the 28 health care facilities visited. There were breaks in infection control practices while administering injections, including observations of 500 ml intravenous infusion bottles used as multi-dose diluent vials and eight of the 28 providers (28.5%) reporting reusing syringes for the same patient. Injection providers reported an average of 2.6 needlestick injuries per year. Contaminated sharps were burned in the open air. Among persons interviewed, XX of the 21 prescribers (90.5%) and 49.2% of the population was aware of the potential risk of HIV transmission through unsafe injections.

Conclusions

A multi-disciplinary initiative is necessary to achieve safe and appropriate use of injections in Mongolia through development of key behaviours among patients and health care workers to reduce

injection overuse and to ensure safe practices, increasing availability and affordability of injection equipment and sharps boxes and appropriate sharps waste management.

Key words:

Injection, Assessment, Mongolia, Hepatitis B virus, Hepatitis C virus, Human Immunodeficiency virus, Cross infection.

INTRODUCTION

A total of 12 thousand million injections may be administered each year in developing and transitional countries. [1] This number, along with reports of unnecessary injections [2] suggests that injections are overused for the administration of medications. Because some of these injections are administered with injection equipment reused in the absence of sterilization, injections are a major mode of transmission of hepatitis B virus (HBV) and hepatitis C virus (HCV). In addition, they may transmit the human immunodeficiency virus (HIV). The estimated worldwide annual incidence of injection-associated infections may reach 8-16 million HBV infections, 2.3-4.7 million HCV infections and 80 000–160 000 HIV infections. [3]

Mongolia (2000 population X XXX XXX) is a large Asian country located between China and Russia. As in many former socialist economies, [4] anecdotal reports suggested that injections were overused to administer medications. In addition, according to an unpublished WHO report, the prevalence of antibody to HCV (Anti-HCV) in Mongolia reaches 16% to 24%, one of the highest proportion in the world. [5] In countries where the prevalence of HCV infection is high, unsafe injections often accounts for a high proportion of infections. [6,7]

To determine whether poor injection practices were a substantial public health problem in Mongolia and to make an initial step towards a safe and appropriate use of injections policy in Mongolia, the Ministry of Health decided to conduct a rapid assessment of injection practices in the country. The objectives of this rapid assessment were to describe injection practices in Mongolia, including injection frequency and injection safety, identify injection practices that may expose injection recipients, injection providers and the general population to infections with bloodborne pathogens and identify the determinants of injection practices.

METHODS

Type of assessment

We used the "Injection Practices: Rapid Assessment and Response Guide" developed by WHO. [8] Methods included interviews of prescribers, interviews and observations of injection providers and interviews of persons from the general population. In addition, interviews of national public health stakeholders framed the Mongolian public health context to ensure the usefulness of the recommendations.

Prescribers, providers and the general population

Sampling methods

We selected a convenience sample of health care facilities in four districts ("Aimags") and the capital city. Mongolian stakeholders considered this selection representative of the national situation. Selected health care facilities were used to identify prescribers, injection providers and the persons from the general population to be included in the sample. For each facility, one or more prescriber and one or more injection provider were selected. In addition, for each facility, approximately three persons from the general population were selected from the community in which the health care facility was located.

Data collection

A specially-trained Mongolian pediatrician interviewed prescribers, injection providers and the persons from the general population to collect information on injection use, injection safety and the determinants of injection practices using standardized questionnaires. These questionnaires were translated into Mongolian and back-translated into English for quality control purposes. In addition, we observed injection practices according to a standardized checklist.

Stakeholders interviews

Key national and international public health stakeholders were interviewed using open-ended questionnaires to identify the projects and activities that could play a role in a future initiative for the safe and appropriate use of injections in Mongolia.

Data analysis

For each variable, proportions and means were calculated using the relevant sample size as denominator. Results for variables estimating the same quantities (e.g., proportion of injections administered by various injection providers) but collected from different information sources (population and prescribers) were compared to validate results.

RESULTS

Characteristics of the sample

We selected 20 health care facilities in urban, semi-urban and rural areas in five districts (Ulaanbaatar, Darhan, Tov, Dornogobi and Ovorkhangai, Figure 1). In these 20 facilities and their catch-up population, we selected a convenience sample of 28 providers, including family doctors (n=1, 3.5 %), nurses in family doctors unit (n=9, 32.2 %) and nurses / primary first aid workers ("feldshers") in public health care facilities (n=18, 64.3 %); 21 prescribers, including family doctors (n=9, 42.9%), general practitioners in public health care facilities (n=10, 47.6%) and primary first aid workers ("feldshers", n=2, 9.5%) and 65 persons from the general population.

Injection practices

Injection use

Injection frequency

Of the 65 persons from the general population, 31 (47.7%) reported having received at least one injection in the last three months (Table 1). These 31 persons reported a total of 210 injections (Annual ratio of injections per capita: 13; ratio of therapeutic to immunization injections 13 to 1). The 21 prescribers reported a total of 1 905 prescriptions per week on average. Of these, 265 (13.9%) would include at least one injection. Reported most common conditions for which injections were prescribed included pneumonia, genitourinary infections, cardiovascular diseases and asthenia. Medications that accounted for the majority of injection prescriptions included antibiotics, vitamins and Dibazolium (an anti-hypertensive drug). We observed intravenous infusions containing only glucose and electrolytes administered to patients who did not require them on several occasions. Prescribers estimated that an average treatment with injections included 20 injections in the case of antibiotics and 10 injections in the case of vitamins. The 28 providers reported administering an total of 2 098 injections on average

each week. Of these, 1 638 (78.1%) were given for therapeutic purposes and 460 (21.9%) were given for immunization purposes (Table 2). In most health care facilities, a nurse was assigned to immunization, while others were in charge of curative injections in a separate room.

Distribution of injections given by selected injection providers

Prescribers reported that the injection providers who would usually administer the injections that they would prescribe included nurses (n=20, 95,2%), general practitioners (n=9, 42,9%), family members (n=9, 42,9%) and first aid workers (n=4, 19%). The 62 persons of the general population reported that of the 210 last injections received that could be remembered, injection providers included nurses (n=51; 82.2%), first aid workers (n=4; 6.4%), physicians (n=2; 3.2%), family members (n=4; 6,4%) and midwives (n=1; 1,6%). In addition, among the 65 persons interviewed in the general population, 21 (32,3%) reported that occasionally, they administered injections themselves to relatives at home.

Settings where injections were administered

Of the 62 last injections received that could be recalled by the general population, reported settings where the injection was given included clinics (n=9; 14.5%), hospitals (n=30; 48.4%) and others, mainly at home (n=23; 37.1%, Figure 2).

Average price paid for injections

Members of the population reported that the average price paid per syringe for curative injection was 80 Tögröd (seven US cents). No patient reported paying any fee for service to injection providers. All persons interviewed reported that injections given for immunization purposes were given free of charge as the Expanded Programme on Immunization (EPI) provided injection equipment.

Injection safety

Risk to the patient

Observed injection providers consistently used freshly opened new disposable syringes and needles for all injections. All the syringes and needles originated from the national manufacturer (MONSAM). Interviews of the general population confirmed observation of providers. Of the 62 persons who could recall their last injection, 51 (82.3%) reported that a new disposable syringe had been used and six (9.6%) could not remember. An additional five persons (8.1%) reported use of sterilizable syringes. However, these injections had been given before 1990. For routine immunization, providers used disposable syringes but reported using auto-disable (AD) syringes for vaccination campaigns. Eight providers (28.5%) reported occasional reuse of syringes with new needles for antibiotic administration to the same patient in hospitals (one syringe per day per patient). This practice was reported in six hospitals where shortage of injection equipment occurred. This practice was also anecdotally reported for injections given at patients' homes either by nurses or by relatives when the poorest population could not afford the required number of syringes.

Observations conducted in hospitals identified additional breaks in infection control practices, including use of 500 ml intravenous infusion bottles as multi-dose diluent vials, use of intravenous infusion bottles for more than one patient, presence of needles left in the septum of multi-dose medication vials and use of needles alone to perform phlebotomies.

Risk to the provider

Of the 28 providers observed, 10 (36%) used puncture and liquid proof containers (safety boxes) for the disposal of contaminated sharps to discard used syringes and needles. Other providers discarded used syringes in a pot or an open cardboard box. Only nurses in charge of the immunization had access to safety boxes, as they were provided by EPI. However, these boxes were often emptied and reused so that the whole health care facility could benefit from it. We observed 19 (67.8%) of the 28 injection providers recapping used needles with a two-handed technique. Commonly, the injection

provider would recap the needle with two hands, collect the recapped contaminated syringe and needle in a box and, at the end of a day, open the box to count by hand the used syringes before disposal. A total of 19 (67.8%) providers reported needlestick injuries in the last 12 months (Annual rate of needlestick injuries: 2.6 per provider and per year). No provider reported receiving hepatitis B vaccine.

Risk to the community

All health care workers followed a national regulation recommending burning of sharps waste at an open site, in a drum or in a stove. No dirty sharps were observed around any of the 20 health care facilities despite the absence of incinerator or any other health care waste treatment options. Nurses and first aid workers giving injections at home reported recapping and bringing back the used syringes in plastic bags to health care facilities. For injections given at home by the population itself, used syringes were disposed with the home garbage. Of the 65 persons interviewed in the general population, only one (1.5%) reported having ever been stuck by a injection needle left in the environment.

Determinants of injection practices

Of 21 prescribers, 18 (85.7%) reported that they did not over-prescribe injections. In addition, 14 (66.7%) reported that patients preferred injections for the treatment of conditions that could be treated with oral medications. Prescribers who admitted prescribing too many injections justified their behaviour on the basis of patients' demand. However, among the members of the general population, 18 (27.7%) reported that they would prefer an injection for the treatment of sickness with fever.

Awareness regarding the risks associated with unsafe injections indicated health care workers knew about HIV and HBV. However, HCV was largely ignored by health care workers and approximately half of the population was not aware that they could acquire HIV infection through unsafe injections. (Figure 2).

DISCUSSION

This rapid assessment provided an overall description of injection practices that could be used to engage prevention activities. In Mongolia, injections are commonly administered by nurses, doctors and the population to administer medications. Many of these injections are unnecessary as they are administered for the treatment of ailment that could be treated with oral medications or that do not require medications. Although reuse of injection equipment in the absence of sterilization is uncommon, other breaks in infection control practices expose injection recipients to infections. In addition, injection providers were exposed to a high risk of needlestick injuries and there was no infrastructure for the management of sharps waste.

The situation that we observed during our assessment contrasts with anecdotal reports that suggest that most injections were given with injection equipment reused in the absence of sterilization before 1990. In 2001, new, disposable injection equipment was used in all the health care facilities that we visited. Three main factors may explain this improvement. First, awareness regarding the risks of transmission of bloodborne pathogens is high among health care workers and substantial in the community. Second, new, locally-produced, disposable, single-use injection equipment is now universally available at low cost in pharmacies and in health care facilities. A governmental commitment to improve injection practices allowed building a production facility in 199X and the use of sterilizable syringes has been completely discontinued. Third, sharps waste is methodically destroyed after use in each health care facility, even though waste treatment options are not available. However, despite these improvements, challenges remain, including a high use rate of injections, breaks in infection control practices while administering injections and IV infusions, poor health care worker protection and the absence of a sharps waste management infrastructure.

The elements that suggest that injections are overused to administer medications in Mongolia include (1) a ratio of injection per person per year higher than any regional estimate worldwide, [9] (2) the reported conditions for which injections are most commonly administered and (3) the types of medications most commonly prescribed through injections. Most prescribers did not perceive that they over-prescribed injections to administer medications and many attributed the high use rate of injections to patients' demand for injectable medications. However, as in many countries, prescribers may overestimate patients' preference for injections. [10] The results of our assessment indicated that only a minority of patients reported a preference for injections in the case of fever, suggesting that patients may be open to oral medications. Finally, the administration of injections by household members, facilitated by the over-the-counter availability of injectable medications through the network of public and private pharmacies, further increases injection overuse among those in the population who do prefer injections for the treatment of common ailments. Injection overuse wastes precious health care resources in Mongolia and should be addressed all the more urgently as hospitals carry large debts to suppliers.

While reuse of injection equipment was uncommon in Mongolia in 2001, unsafe practices persist that may be harmful to injection recipients. In 1998-1999, the prevalence of HCV infection was still 8% among children 0-7 years in Ulaanbaatar. [11] The report of reuse of injection equipment on the same patient in hospitals is all the more concerning as it is associated with a widespread use of 500 ml multi-dose diluent vials. Such practices create opportunities for cross-infection through contamination of multi-dose vials and have been associated with infection with bloodborne pathogens. [12] In addition, the use of needle alone to perform phlebotomies creates opportunities for environmental contamination with blood. Experience from other countries where injection are overused, suggests that even if injection equipment is not reused, other breaks in infection control practices may lead to bloodborne pathogen transmission. [13] Reasons that may explain unsafe

injection practices in Mongolia include an insufficient understanding of the spread of bloodborne pathogens in health care setting, shortages of injection equipment and the overuse of injections that wastes available equipment.

Health care workers in Mongolia commonly recapped used needles using the two-handed technique and reported a high frequency of needlestick injuries. Educational posters for injection providers have been widely distributed to illustrate safe, one-handed scoop recapping technique and to teach appropriate discarding techniques. However, other factors lead injection providers to engage in unsafe practices. First, sharps containers are provided for the sole purpose of EPI that accounts for a minority of all injections. Second, a policy recommendation formulated to prevent reuse of contaminated equipment requests health care workers to clean and count dirty injections before final incineration. [14] These system issues need to be addressed to protect health care workers in the country.

In contrast to the situation observed in many developing countries where contaminated sharps can be observed around half of the clinics, [15] no dirty sharps waste could be observed in the vicinity of health care facilities in Mongolia. Instead, there was a remarkable discipline to burn contaminated sharps by any local means. The policy requirement from the Ministry of Health requested to keep records of destruction of used injection equipment. [14] Illegal recycling of disposable injection equipment has never been reported in Mongolia, even on the black market. While such policy framework stipulating that the health system needs to manage its waste as part of the duty of care principle is an essential first step to a health care waste management policy, open-air burning or drum-incineration can only be considered an interim solution as low temperature incineration may produce persistent organic pollutants, including dioxins and furanes. [16] Safer and more environment-friendly treatment options for health care waste disposal are urgently needed in Mongolia.

This assessment suffers from three main limitations. First, we were not able to completely rule out the reuse of injection equipment in the absence of sterilization in Mongolia. The number of health care facilities that we visited was small, half of the general population was not aware of the risk of HIV infection associated with unsafe injections and shortages of injection equipment were reported. Thus, efforts conducted by the Ministry of Health to eliminate reuse of injection equipment in the absence of sterilization should be continued. Second, our review of prescriptions was conducted in outpatient facilities and did not address the use of injections in hospitals or in homes that represent a majority of injections in Mongolia. Thus, injection frequencies as reported by the general population may be more representative of injection use in the country than the information we obtained through prescription reviews. Third, our assessment of the proportion of injections given for immunization purposes as reported by the injection providers was conducted in out-patient facilities and did not address the use of injections in hospitals or in homes. These injections represent the majority of injections administered in Mongolia. Thus, the ratio of immunization to curative injections as reported by the general population may be more representative of the situation in the country.

On the basis of the results of this assessment, the Ministry of Health of Mongolia is committed to implement policy and plans to institutionalize the safe and appropriate use of injections. To decrease injection overuse, a multi-prong approach will be used that may include interactional group discussions between patients and prescribers, [10] revision of recommended treatment protocols that encourage injection overuse, promotion of new standards of care through respected opinion leaders in the medical community, restricted access to over-the-counter injectable medications and a promotion of oral drugs in the community. To improve injection safety, the proposed approach will include risk communication addressing identified unsafe practices and targeting patients and health care workers, provision of safety boxes in quantities that match the number of syringes provided and repelling the requirement to count by hand used injection equipment. Finally, to improve sharps waste management, a procurement

plan is being prepared to increase access to waste treatment options within a policy framework that would provide financial support for running and maintenance costs, manage health care waste from production to final disposal and train actors of the system at all levels.

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Injections in Mongolia - **Error! Not a valid link.**

TABLES

Table 1: Results of interviews with the general population, rapid assessment of injection practices in Mongolia, September 2001 (n=65)

Characteristics	#/Total (%)
Self-report of an injection in the last 3 months	X/65 (47,7%)
Last injection received recalled	X/65 (95.4%)
Reported provider for the last injection received:	
<i>Nurse</i>	X/62 (82.2%)
<i>Physician</i>	X/62 (3.2%)
<i>First aid worker</i>	X/62 (6,4%)
<i>Family member</i>	X/62 (6,4%)
<i>Midwife</i>	X/62 (1.6%)
Reported setting for the last injection received:	
<i>Clinic (family doctor unit)</i>	X/62 (14,5%)
<i>Hospital</i>	X/62 (48,4%)
<i>Home</i>	X/62 (37,1%)
Preference for injections in the case of fever	X/65 (27.7%)
Administration of injections to relatives or neighbours	X/X65 (32,3%)
Lifetime occurrence of a needlestick with a needles left in the environment	X/65 (1,5%)

Table 2: Results of interviews and observation with injection providers, rapid assessment of injection practices in Mongolia, September 2001 (n=28)

Characteristics	#/Total (%)
Vaccinations among injections administered weekly	XXX/XXX(8 %)
Therapeutic injections among injections administered weekly	XXX/XXX(78.1%)
Use of new disposable injection equipment	XX/XX(100%)
Report of occasional reuse of disposable injection equipment on the same patient	XX/XX(28.5%)
Recapping with two hands after injection administration	XX/XX(67.9%)
Self-reported needlestick injury in the last 12 months	XX/XX(67.8%)
Report of receiving three doses of hepatitis B vaccine	XX/XX(0%)

FIGURES

Figure 1: Aimaqs (Districts) selected for the rabid assessment, Moneolia, September 2001

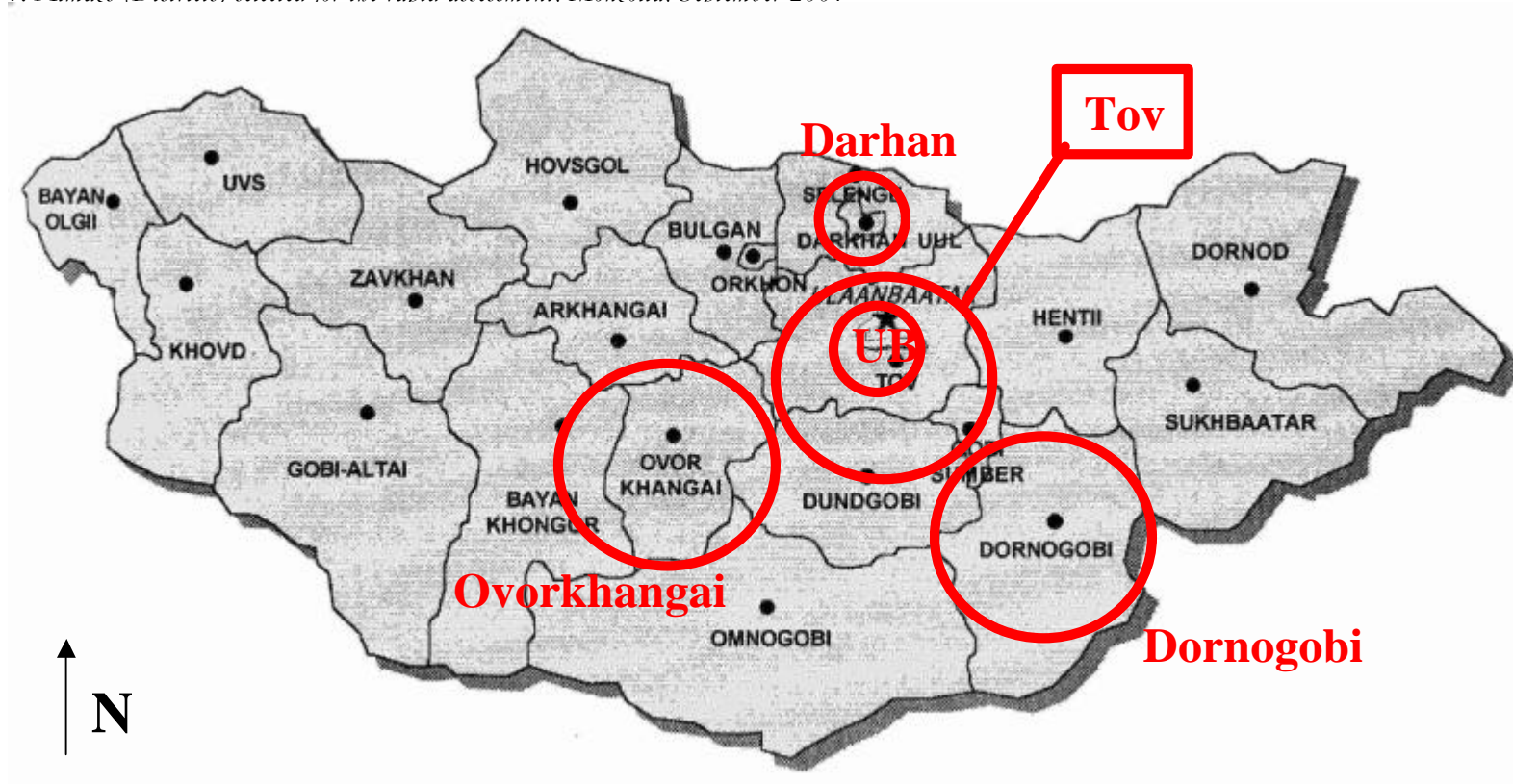


Figure 2: Reported setting for the 62 last injection that could be recalled by the 65 members of the general population interviewed, Mongolia 2001

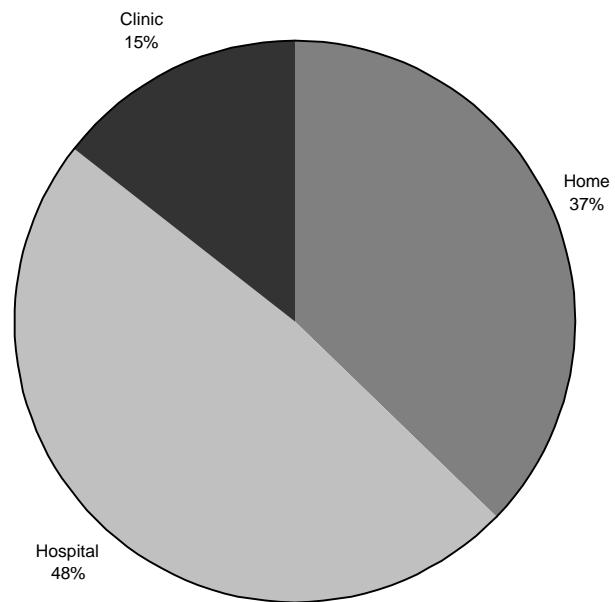


Figure 3: Proportion of prescribers, injection providers and population spontaneously reporting that selected bloodborne pathogens may be acquired through unsafe injections. Mongolia, 2001

