

# **INFECTION CONTROL TRAINING CENTERS**

ASSESSMENT of TRAINING IMPACT on  
HOSPITAL INFECTION CONTROL PRACTICES

## **SUMMARY REPORT**



**AMERICAN INTERNATIONAL HEALTH ALLIANCE**

**July 2004**

## **Table of Contents**

List of Acronyms and Abbreviations.....	3
Executive Summary .....	4
Assessment Team Members .....	4
Acknowledgments.....	4
I. Introduction.....	5
II. Objectives .....	5
III. Methodology .....	5
IV. Findings.....	6
V. Conclusions.....	10

### Appendices

Appendix 1: List of Institutions Surveyed.....	12
Appendix 2: Questionnaire .....	13

## **LIST OF ACRONYMS AND ABBREVIATIONS:**

AIHA	American International Health Alliance
APIC	Association of Professionals in Infection Control and Epidemiology
CDC	Centers for Disease Control and Prevention
HMI	Harvard Medical International
IC	Infection Control
ICTC	Infection Control Training Center
INQUAL	Hospital Infection Prevention and Quality Assessment
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
M&E	Monitoring and evaluation
SHEA	Society of Healthcare Epidemiology of America
WHO	World Health Organization

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## **EXECUTIVE SUMMARY**

The American International Health Alliance (AIHA) initiated an Infection Control Program in 1997 to address the spread of hospital infections in Eurasian countries. The first Infection Control Training Center (ICTC) was established in Russia and staff from this Center assisted in the establishment of ICTCs in Georgia, Kazakhstan, and Ukraine in 2001. The ICTCs develop and implement standardized protocols for conducting active hospital surveillance and effective infection prevention practices, and disseminate infection control reform policies and procedures. As the faculty increased its expertise and demonstrated results through changes in practices and scientific studies, the Ministries of Health began to involve the ICTCs in a consultative role to assist in national policy reform.

In order to assess the effectiveness of the program, AIHA conducted telephone surveys of 50 hospitals, representing a sample from St. Petersburg, Russia; Tbilisi, Georgia; Almaty, Kazakhstan; and Kiev, Ukraine. The survey questionnaire was consistent with the AIHA Infection Control Results Framework.

The surveyed hospitals had an average of 435 beds and 74% reported Nosocomial Infections as an important problem. All hospitals reported functioning infection control committees which were staffed appropriately for the most part. Eighty-eight percent of the institutions conducted surveillance for Nosocomial Infections and 78% of institutions performing surgery conducted wound infection surveillance. But, the definitions for recording infections were appropriate in only 13 of the 50 hospitals and the frequency and timing of surveillance varied considerably. The active (incidence density) method of surveillance was reported by only half of the surveyed hospitals. Moreover, recent surveillance data for verification was not available.

Among the reporting hospitals, 70% indicated that antibiotic resistance was a concern and the majority of hospitals used antibiotic prophylaxis for surgery. Although 34 of the 50 hospitals reported testing specimens for antibiotic resistance, no supportive data were provided. Nearly all hospitals practiced “universal precautions” related to needles and gloves. Eleven hospitals reported cases of hepatitis B or C in employees during the past two years. Infection control guidelines or protocols for nursing were used in 82% of the reporting hospitals and formal IC protocols were in place in 75% of the reporting hospitals.

Overall, infection control had been accepted, but in practice there were shortcomings with respect to definitions, standard numerator and denominator counts, rates, and active surveillance. Only a few hospitals provided credible institutional or surgical data and nearly 20 percent reported an implausible zero infection rate. Routine laboratory data was not available to confirm reported antibiotic resistance. The role of an infection control practitioner or other nurse had not been integrated in the process. Based on these findings, a new effort is recommended for promoting standard epidemiologic and laboratory methods for guiding and documenting outcomes in infection control and antibiotic use.

## I. INTRODUCTION

Due to decades of scientific isolation and the absence of an evidence-based approach to medical and public health decision making, most Eurasian healthcare facilities have not instituted internationally recognized infection control principles and practices. To expand training capacity in infection control, clinical epidemiology, and evidence-based practices and to reduce patient mortality and morbidity due to infections, AIHA, in collaboration with US expert partners, created infection control training centers (ICTCs) in four countries—Russia, Ukraine, Georgia, and Kazakhstan. The first center, established in 1997 in St. Petersburg at the St. Petersburg Medical Academy in the name of I.I. Mechnikov, is a state-of-the-art training center licensed by the Russian Ministries of Health and Education. The St. Petersburg center served as the model for the other three centers (established in 2001) and personnel from the St. Petersburg ICTC conducted much of the training and initial assessments for the other ICTCs.

The ICTCs provide theoretical and practical evidence-based courses to practicing epidemiologists, physicians, and nurses. Clinical practice guidelines based on internationally recognized infection control principles and practices and instructional materials, such as the 2<sup>nd</sup> Edition *Basic Infection Control Manual* created by the St. Petersburg and Harvard Medical International partners and produced by AIHA, are provided. AIHA supplied each center with three to five computers and manuals. AIHA supported Internet connectivity for the centers in order to foster a supportive community of epidemiologists and physicians connected to professional counterparts worldwide.

This summary presents a descriptive analysis of the results of telephone surveys conducted with representative infection control participants from fifty (50) hospitals in the former Soviet Union countries of Russia, Ukraine, Georgia and Kazakhstan. Respondents were questioned on the demographic and infection control related characteristics of their individual hospitals, their infection control programs, and pertinent infection control concerns in their institutions.

## II. OBJECTIVES

The purpose of this survey was to evaluate whether infection control practices among clinical staff at the hospitals targeted by the AIHA's Infection Control Program had improved and to measure the sustainability of the ICTCs. Furthermore, the survey was to:

- 1) to determine the percentage of hospitals from a pre-selected sample targeted by the AIHA Infection Control Program that demonstrated basic infection control practices by their clinical staffs<sup>1</sup>; and
- 2) to determine the number of hospitals from a pre-selected sample that demonstrated the active processes of a standard infection control program<sup>2</sup>.

## III. METHODOLOGY

Although the Infection Control Cross-Partnership Programs in the four countries have conducted training for a number of institutions throughout the northwest region of Russia, Central Georgia, Southern Ukraine and Southern Kazakhstan, only institutions from St. Petersburg, Tbilisi, Kiev and Almaty were included in this survey due to limited funding. These institutions serve as a representative sample of the medical institutions in the four countries.

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<sup>1</sup> *Definition:* A hospital demonstrated basic infection control practices if a respondent answered "yes" to at least 8 out of 10 survey questions # 2, 4, 5, 7, 14, 16, 17, 19, 21, 24. Hospitals not offering surgical service were exempt from answering questions # 7, 17, 19 but they were required to answer at least 5 out of 7 survey questions.

<sup>2</sup> *Definition:* A hospital demonstrated the active processes of a standard infections control program if a respondent answered "yes" to survey questions #5 and 7. Hospitals not offering surgical service were exempt from answering question # 7.

The interviews were conducted by the AIHA regional staff, using a prepared standard written questionnaire. The institutions contacted for this survey are listed in Appendix 1. A copy of the questionnaire is in Appendix 2. Forty-three (43) of the 50 interviewees reported having previously completed an ICTC course in infection control.

#### METHODOLOGY LIMITATIONS

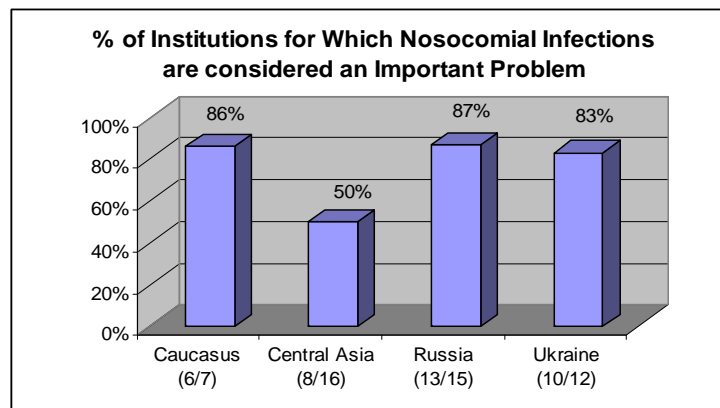
The survey methodology involves by its nature a certain degree of subjectivity, as participants' responses can be somewhat biased and may not fully represent a true image of the institutions' infection control (IC) practices. AIHA had limited influence on the quality of responses and was dependent on the goodwill and honesty of the surveyed individuals.

### IV. FINDINGS

#### Institutional Information

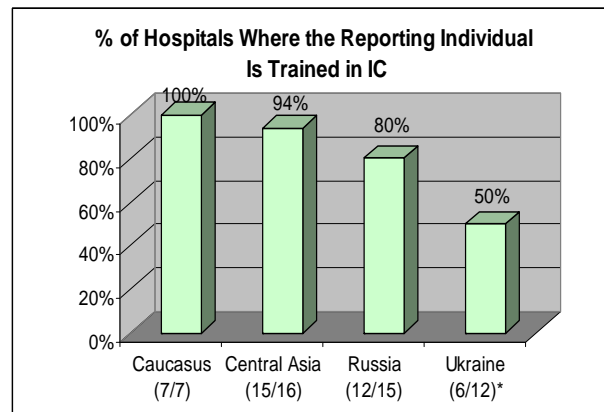
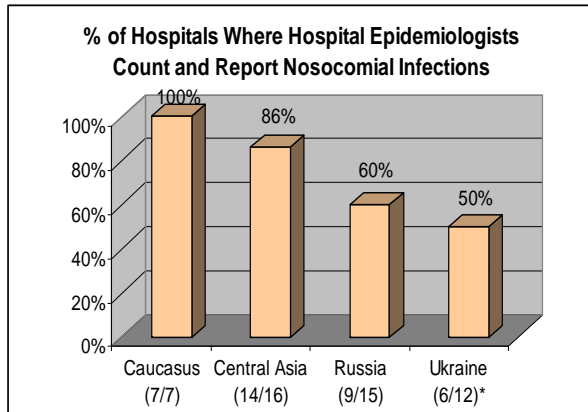
The reporting institutions ranged in size from 50 to 1,800 beds with an average of 435 beds. Because insufficient data were reported by the total group, the numbers of annual admissions or surgical procedures performed in the previous year are not available.

Thirty-seven of the 50 institutions (74%) reported that Nosocomial Infections were considered an important problem in their facility.



#### Infection Control Committee Organization and Function

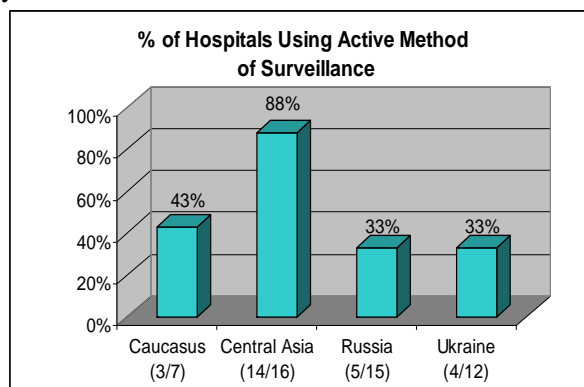
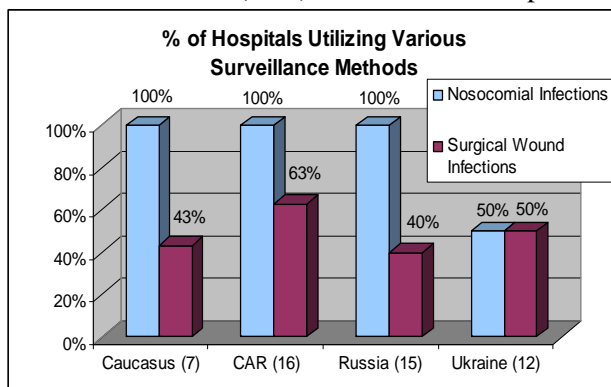
All 50 respondents (100%) reported the presence of an infection control committee in their institution. These committees met monthly or quarterly in most hospitals (40/50) and were usually chaired by a senior physician or surgeon (13/15). At eighty percent (80%) of the hospitals, the committee membership included a hospital epidemiologist. Nosocomial Infections were counted and reported to the committee by the hospital epidemiologist in 72% (36/50) of the hospitals. In 40 of the 50 institutions, the reporting individual was considered to be trained in infection control.



\*Only eight (8) Ukrainian hospitals answered this question

### Surveillance Methods, Reports and Data

Surveillance for Nosocomial Infections occurred in 44 hospitals and for surgical wound infections in 29 of the 37 (78%) hospitals performing surgery. The definitions reportedly used for recording infections were appropriate for timing, content, or source in only 13 of the 50 hospitals. The frequency and timing of surveillance was reported as highly variable among the institutions. The method of surveillance was reported to be the accepted (in the U.S.) active (incidence density) method in over half (26/50) the hospitals, but passive reporting by individual physicians, a method known to seriously underreport infections, continued to be used in 14 hospitals. Environmental culture monitoring (4/50) and monitoring with staff sanctions (1/50) continued to be reported by some institutions in Russia.

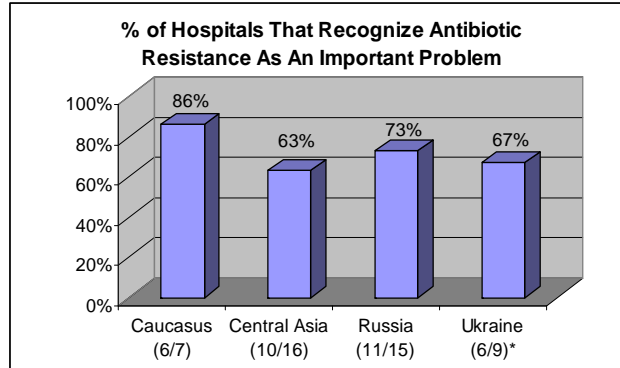


Although the process and technical methods of surveillance were reportedly being used by many respondents, little useful information was offered in the associated responses on recent surveillance data from these institutions. Meaningful numerators (number of infections) and denominators (patient population) were reported by only 14 (three in Caucasus, eight in CAR, two in Russia, and one in Ukraine); credible data was reported by less than half of these; and “a zero infection rate” was reported by nine others. In the 26 hospitals indicating surveillance of surgical wounds, infection rate data were available for 20 hospitals. Of these, eighteen (18) were able to offer actual numerator and denominator counts, but only six were able to calculate rates with credible boundaries.

### Surveillance of Antibiotic use and Antibiotic Resistance

Thirty-three of the 47 reporting hospitals (70%) recognized antibiotic resistance as an important problem in their institutions. Four failed to report any information on this issue. Antibiotic prophylaxis for surgery was used in the majority of hospitals. Cephalosporins were the most common antibiotics used. Patient bacterial specimens were reported as consistently tested for antibiotic resistance in 34 institutions,

but data to support this finding were not provided. The most frequently reported resistant organisms are *staphylococcus aureus* (21 citations) and *pseudomonas aeruginosa* (9 citations).



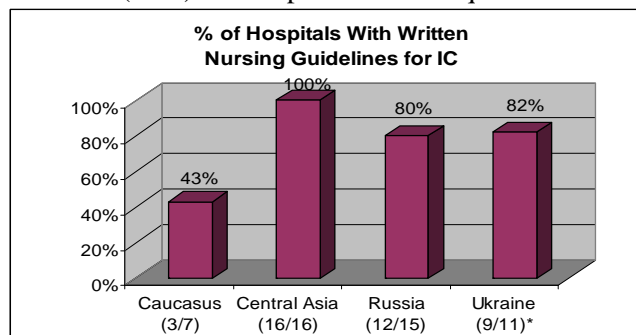
\* Only nine (9) hospitals in Ukraine reported on this question

### Universal Precautions (Standard Practice)

“Universal precautions” is a recognized term and the related procedure(s) were reported as accomplished in 47 of the 50 hospitals surveyed. Compliance with these procedures was reported to be monitored and enforced by infection control standards in 16 hospitals, through administrative standards in 17 other hospitals, and by both standards in 6 hospitals. Intravascular needles were reused in only seven of the 15 institutions; in six of these institutions needles were reprocessed by autoclaving. However, one institution reported the continuing use of dry heat for reprocessing of needles. All hospitals conducting surgery reported use of gloves by all participants on the surgical team during operative procedures and all but 1 (49/50) during routine cleanup thereafter. However, eight institutions reported not using gloves during surgical instrument cleaning and processing. Eleven of the institutions recorded cases of hepatitis (B or C) in employees during the past year (two cases in Central Asia, six in Russia, and three in Ukraine).

### Information on Nursing Practices Related to Infection Control

Forty of the 49 (82%) reporting hospitals indicated that infection control guidelines or protocols were in use for current nursing practices. The hospital epidemiologist or the infection control practitioner was reported as responsible for the preparation, update, and review of these protocols in 31 (63%) of the hospitals. The percentage of nurses trained and the frequency of their training was highly variable (< 15% to 100%) in those institutions (58%) that responded to this question.



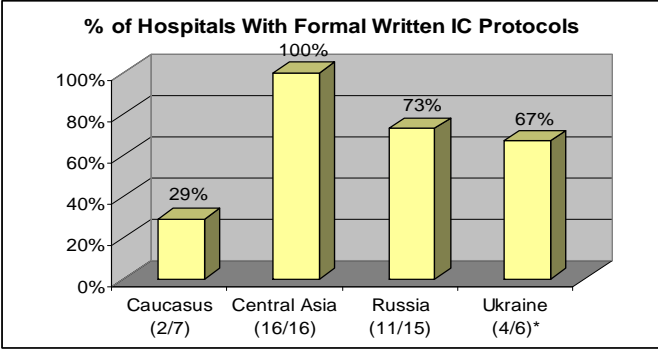
\* Only eleven (11) hospitals in Ukraine reported on this question

### Quality Improvement for Infection Control

Thirty-three of the 44 institutions reporting (75%) had formal written IC protocols in place. In 17 of these hospitals (52%) the hospital epidemiologist and or the infection control committee developed and implemented these protocols. The most frequently used resources for information on infection control protocols were the Ministry of Health (12) and AIHA (14). Other frequently cited sources included: City



Government (7), a local University (5), Centers for Disease Control (CDC) (3), the World Health Organization (WHO) (3), Internet (3), and books and journals (3).



\* Only six (6) hospitals in Ukraine reported on this question

## V. CONCLUSIONS

The goal of this survey was twofold: (1) to determine the percentage of hospitals from a pre-selected sample targeted by the AIHA Infection Control Program that demonstrated acceptance and use of basic infection control practices by clinical staff, and (2) to determine the number of hospitals from a pre-selected sample that demonstrated an active infection control program. The survey instrument was designed to match categories in the AIHA Infection Control Results Framework. The instrument was pilot tested in Russia, Georgia, Ukraine and Kazakhstan to ensure that questions were appropriate and was revised slightly based on the pilot tests.

While descriptive questionnaire data from this type of survey are open to questions of reliability and completeness, it appears that these trained respondents, with some notable exceptions, understood the inquiries put to them and were able to confirm the existence of major portions of infection control practices in their institutions. According to our definition, 80% of the surveyed hospitals (40 of 50) demonstrate acceptance and use of basic infection control practices by clinical staff and 68% of the surveyed hospitals (34 of 50) demonstrate an active infection control program.

These institutions used hospital epidemiologists, had a committee structure, and used the input of these individuals and of senior clinical personnel in the area of infection control. Most of the hospital epidemiologists were trained and were given responsibility on the committee for generating institutional infection control guidelines and protocols. But, the institutions appeared to not have accepted the role of an infection control practitioner or other nurse as an integral and active part of the process. In addition, there appeared to be vocal and significant outliers in accepting some goals of infection control programs, especially in accepting the use of standard epidemiological definitions and methods in program processes.

Surveillance was accepted as a concept, but the methodology as currently implemented did not appear to routinely use appropriate definitions, standard numerator and denominator counts, rates, and active surveillance as accepted, taught, and implemented in Western evidence-based programs. The common use of passive reporting by physicians, continued environmental sampling in several institutions, and even staff sanctions in one hospital are problematic and evidence of continuing support for antiquated methods and continuing lack of support for current modern concepts. These problems appeared to be confirmed by only six to seven institutions providing either institutional or surgical data that is credible to the knowledgeable reviewer. The reports of “zero infection rates” by nine (9) hospitals (nearly 20%) was especially troubling and demonstrated a lack of understanding and a lack of acceptance of responsibility for these important factors in medical care.

Microbial resistance to antibiotics was widely viewed as a problem and concomitant testing was reported to be broadly accomplished, but routine summary laboratory data were not available to support this finding. Universal precautions were recognized as a concept and were reported to be accepted and implemented by over 94% of these institutions. However, unacceptable variations in glove use and needle reprocessing remained in some institutions. The evidence on the continued appearance of hepatitis B and C (or other blood borne diseases) in these healthcare populations needs to be carefully reviewed in future studies to assure that prevention of blood borne transmissions in these workers is minimized.

Infection control guidelines and protocols (such as the 2<sup>nd</sup> Edition AIHA Basic Infection Control Manual) were routinely available and probably used in these hospitals, but formal internal training appears to be more limited. Support for infection control training and consultation was provided by the Ministries of Health, City Government (Health Departments), and local Universities. However, these do not exceed the citations from the AIHA.

### **Lessons Learned/Recommendations**

A solid foundation for administrative and personnel structures for infection control programs appeared to have been established in these institutions under the leadership of the ICTCs and in cooperation with the AIHA Partnership Initiative. Procedural Institutional and nursing guidelines and protocols for infection control practices had been established and were being reviewed and used in training, as recommended.

Surveillance had begun in most institutions and some data were reported. But, precise definitions, active numerator data collection, matching with appropriate denominators, and comparative rate reporting was lacking. This prevented the documentation of the relationship between infection control processes and outcomes of decreased Nosocomial Infections in most of these institutions. The methodological shortcomings need to be addressed to verify these relationships.

Antimicrobial resistance was reported as an important concern and laboratory supportive practices were reportedly common, but no data to support this outcome was found in the responses. As with surveillance, microbiology laboratory practice in support of infection control and appropriate antimicrobial use needs to be confirmed by routine standard reports of credible information.

Continued future support for these programs should reinforce the administrative and personnel requirements for infection control programs in these and all medical care institutions. New efforts are recommended to identify, accept, and use standard epidemiologic and laboratory methods as the necessary processes for guiding and documenting improved future outcomes in infection control and antibiotic use.

It is in the best interest of the U. S. to continue to support these efforts, not only to improve local medical care for humanitarian reasons, but as a means of reducing the significant probability of a serious “blow back” of highly resistant, untreatable infections from these areas which could be transmitted quickly in American medical populations, especially those in the rapidly growing portions of the aging and highly immuno-compromised.

**Appendix 1: List of institutions surveyed**

<b>Central Asia</b>	<b>Russia</b>
<p>Urology Research Center named after Jarbusynov                      Akmola Oblast Hospital                      Kostanay Oblast Pediatric Hospital                      Kyzyl Orda City TB Clinic                      Kostanay City Children’s Infection Hospital                      Shymkent City Maternity House #2                      Astana City Maternity House #1                      Shymkent City First Aid Hospital                      Semipalatinsk Hospital                      Kyzyl Orda Oblast Infectious Hospital                      Kyzyl Orda Oblast Infection Hospital                      Kyzyl Orda City Maternity House                      Shymkent City Maternity House #4                      Shymkent Oblast Hospital                      Hospital of Kazakh-Turkish University, Shymkent City                      Kazakh Oncology and Radiology Institute</p>	<p>City Hospital #2                      City Hospital # 16 (Mariinsky)                      City Hospital #26                      City Hospital #31                      City Hospital #46 (Saint Eugene’s)                      Hospital of War Veterans                      Psychiatry Hospital #1                      Tuberculosis Hospital                      City Children’s Hospital #1                      Children’s Hospital #3 for Infectious Diseases                      City Children’s Hospital #17 (of St. Nikolas)                      Cherepovets City Hospital                      Chelyabinsk Oblast Hospital                      Samara Oblast Clinical Hospital                      Leningrad Oblast Clinical Hospital</p>
<b>West NIS</b>	<b>Caucasus</b>
<p>Children’s Clinical Hospital # 2                      Kiev City Pediatric Clinic # 1                      Kiev City Clinical Hospital # 18                      Kiev City Clinical Hospital # 10                      Kiev City Clinical Hospital # 6                      Kiev City Clinical Hospital #12                      Kiev City Clinical Hospital # 5, Kiev City AIDS Center                      Kiev maternity Hospital # 3                      Kiev City Clinical Hospital # 11                      Kiev City Clinical Hospital # 9                      Kiev City Clinical Hospital # 8                      Kiev City Clinical Hospital # 16</p>	<p>Iashvili Central Children's Hospital                      Central Clinic of Tbilisi State Medical University                      National Center of Surgery                      Clinical Hospital #4                      Clinical Hospital #5                      National Center of Surgery                      Jhvania Pediatric Clinic of Tbilisi State Medical University</p>

**Appendix 2: Questionnaire**

**Survey of Hospital Trainees in Infection Control**

Date of Interview:
Name of Respondent:
Title:
Name of Institution:
When did you complete an AIHA course on Infection Control? Yr. _____ Month _____ Did not complete course _____

**General Information**

1. What is your Hospital's current census? \_\_\_\_\_ How many admissions to your hospital have there been in the past year? \_\_\_\_\_ Does your Hospital have a surgical service? (Yes/No)  
If yes, how many surgeries (procedures) were done in the past year? \_\_\_\_\_

2. Does your Hospital have an Infection Control Committee? (Yes/No) How frequently does it meet?  
\_\_\_\_\_ Who is the Chairman of the Committee? (Position) \_\_\_\_\_ What are the positions of the other members of the committee?  
\_\_\_\_\_

3. Please provide the case definition of nosocomial infections utilized by your institution.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Are Hospital Infections an important problem in your hospital at the current time? Yes\_\_\_\_ No\_\_\_\_  
Don't know\_\_\_\_\_

***(Results Framework Objective 1: Improved surveillance and assessment capacity in the areas of nosocomial infections and a/b resistant microorganisms.)***

**Improved Surveillance (nosocomial infections)**

5 Have you surveyed for Hospital Infections in the past year? (Yes/No) If yes, how frequently were these surveys conducted? \_\_\_\_\_

6. What method(s) did you use for surveillance? Please provide specific details.  
*[Note to interviewer: The type of responses we are looking for include: Active surveillance (concurrent, prospective or retrospective); Prevalence studies; and/or Passive surveillance]*

7. Did you survey for Surgical Wound Infections in the past year? (Yes/No) If yes, what was your rate for those surgeries surveyed \_\_\_% (Please provide the raw numerator and denominator if possible i.e. 3 infections in 136 surgeries done and surveyed.) \_\_\_/\_\_\_\_\_

8. Do you use antibiotic prophylaxis in surgery? (Yes/No) If yes, please list the antibiotics that are used for each surgical procedure.

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9. How many Hospital (nosocomial) infections were identified in your hospital in the most recent month surveyed? \_\_\_\_\_ How many patients were surveyed? \_\_\_\_\_

10. Who identifies, counts and reports Hospital Infections to your Committee in your hospital? (Position?) \_\_\_\_\_ Has this individual attended a course on Infection Control? (Yes/No)

**Improved Surveillance (antibiotic resistance)**

11. Is antibacterial resistance an important problem in your Hospital? (Yes/No)

12. How often does your hospital microbiology laboratory test for antimicrobial resistance in bacteria causing infections in your hospital? \_\_\_\_\_

13. What is the most prevalent resistant bacteria detected in your hospital? \_\_\_\_\_

**Universal Precautions: General**

14. Does your Hospital practice Universal (Standard) Precautions for blood-borne diseases?

Yes \_\_\_ No \_\_\_ Don't know \_\_\_ Not familiar with term \_\_\_

If Yes: Does your hospital practice universal precautions: All of the time \_\_\_ Part of the time \_\_\_ Rarely \_\_\_?

If No, please explain why not : \_\_\_\_\_

*[Note to interviewer: potential responses include: (1) because they are not told to do so; (2) because they are not properly supervised to do so; (3) because they do not believe that it is important to do so; or (4) because they do not have adequate equipment and supplies to do so.]*

15. How does your hospital enforce practice of universal precautions? \_\_\_\_\_

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16. Are injection and/or intravenous needles reused at your hospital? (Yes/No)

If Yes: Does your hospital reuse injection and/or intravenous needles: All of the time \_\_\_ Part of the time \_\_\_ Rarely \_\_\_

How are they disinfected? \_\_\_\_\_

*[Note to interviewer: potential responses include: boiled, steam/heat sterilized, use of liquid/chemical]*

**Universal Precautions: Surgical**

17. Do **all** individuals **performing or assisting** in all major and minor surgical procedures wear gloves during the **entire** procedure? (Yes/No)

If Yes: Do they wear gloves during surgical procedures: Always\_\_\_\_ Sometimes \_\_\_\_ Rarely\_\_\_\_?

18. Do **all** individuals **performing or assisting** in all major and minor surgical procedures wear gloves during cleanup of instruments and Operating Room surfaces after the cases? (Yes/No)

If Yes: Do they wear gloves during cleanup: Always\_\_\_\_ Sometimes \_\_\_\_ Rarely\_\_\_\_?

19. Do **all individuals conducting surgical instrument cleaning and sterilization** after surgical cases wear gloves during this process? (Yes/No)

If Yes: Do they wear gloves during cleaning and sterilization of the surgical instruments: Always\_\_\_\_ Sometimes \_\_\_\_ Rarely\_\_\_\_?

20. Have any of the surgical (surgeons, physicians), nursing, support staff or students on your surgical services and wards developed Hepatitis (B or C) in the past 2 years? (Yes/No)

**Nursing Practices**

*(Results Framework Objective 3, Reference indicator 3.1: % of hospitals targeted by AIHA Infection control program with improved infection control practices of clinical staff)*

21. Does your institution have infection control protocols/guidelines in place for nurses? (Yes/No)

If yes, who is responsible for reviewing and updating these guidelines? (Position) \_\_\_\_\_

22. What percentage of the nurses at your institution have received training in infection control?

\_\_\_\_\_

Please describe the length and nature of the training:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

23. How frequently do your nurses receive training on infection control practices?

\_\_\_\_\_

**Quality Improvement**

*(Results Framework Objective 3: Improved infection control practices based on evidence-based clinical and management practice protocols.)*

24. Does your institution have written infection control protocols in place? (Yes/No)

25. What is the method utilized for developing, reviewing, and/or implementing infection control protocols at your institution?

*[Note to interviewer: Try to find out whether these activities are done by a committee (which committee?), or by an individual; who directs, who determines, who reviews? What are the positions of the important actors in the process and what are their titles]*

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26. What public-domain resources, if any, does your institution utilize when developing/reviewing infection control protocols?

*[Note to interviewer: Anticipated responses include the following: US Centers for Disease Control (CDC); World Health Organization (WHO); Internet; Cochran database ]*