

## **Infection Control in Guatemala: Life of Project Report 2008-2011**

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## **About SPS**

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

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## **Key Words**

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## ABBREVIATIONS AND ACRONYMS

AMR	Antimicrobial resistance
CAIMI	Centro de atención integral materno-infantil
CAP	<i>Centro de atención permanente</i> (health center)
CNE	National Center for Epidemiology
HCI	Health Care Improvement program
IC	Infection control
ICAT	Infection control assessment tool
MoH	Ministry of Health
MSH	Management Sciences for Health
RCQI	Rapid cycle quality improvement
RPM Plus	Rational Pharmaceutical Management Plus program
SAIDI	South American Infectious Disease Initiative
SIAS	Sistema Integral de Atención de Salud
SPS	Strengthening Pharmaceutical Systems program
USAID	United States Agency for International Development
USME	Unit of supervision and monitoring and evaluation
VMH	Vice Ministry of Hospitals

## **ACKNOWLEDGMENTS**

The Ministry of Health Guatemala had a vision to improve quality of care through a strategy to improve practices of prevention and control of nosocomial infections and requested SPS support to implement this. Their leadership in this process was fundamental. The staff of the Vice Ministry of Hospitals and in the Sistema Integral de Atencion de Salud (SIAS) were receptive and collaborative in the process. It is important to acknowledge the special role of key people in the MoH: Dr Manuel De Leon, VMH; Elvita Dubon, Department of Developing Health Services, SIAS; Luis Castellanos and Karen Castillo, Unit of Supervision, Monitoring and Evaluation, SIAS; Carmina Reynosa, Department of Nursing, SIAS. This work was only possible because of the leadership and enthusiasm of these people and the financial support of USAID Guatemala.



## INTRODUCTION

Since their discovery during the 20th century, antimicrobial agents (antibiotics and related medicinal drugs) have substantially reduced the threat posed by infectious diseases. The use of these “wonder drugs”, combined with improvements in sanitation, housing, and nutrition, and the advent of widespread immunization programs, has led to a dramatic drop in deaths from diseases that were previously widespread, untreatable, and frequently fatal. Over the years, antimicrobials have saved the lives and eased the suffering of millions of people. By helping to bring many serious infectious diseases under control, these drugs have also contributed to the major gains in life expectancy experienced during the latter part of the last century. These gains are now seriously jeopardized by the emergence and spread of germs that are resistant to cheap and effective “first-line” drugs. The bacterial infections which contribute most to human disease are also those in which emerging and microbial resistance is most evident: diarrheal diseases, respiratory tract infections, meningitis, sexually transmitted infections, and hospital-acquired infections. Some important examples include penicillin-resistant *Streptococcus pneumoniae*, vancomycin-resistant enterococci, methicillin-resistant *Staphylococcus aureus*, multi-resistant salmonellae, and multi-resistant *Mycobacterium tuberculosis*. The development of resistance to drugs commonly used to treat malaria is of particular concern, as is the emerging resistance to anti-HIV drugs.

Hospitals are a critical component of the antimicrobial resistance (AMR) problem worldwide. The combination of highly susceptible patients, intensive and prolonged antimicrobial use, and cross-infection have resulted in nosocomial infections with highly resistant bacterial pathogens. Resistant hospital-acquired infections are expensive to control and extremely difficult to eradicate. Failure to implement simple infection control (IC) practices, such as hand washing before and after contact with patients, is a common cause of infection spread in hospitals and health facilities throughout the world. Hospitals are also the eventual site of treatment for many patients with severe infections due to resistant pathogens acquired in the community.

IC is a fundamental intervention to prevent the emergence and spread of AMR in hospitals and health facilities. However, developing effective IC programs in resource-constrained countries remains a challenge.

## STRATEGIC APPROACH

Under USAID's (US Agency for International Development) Rational Pharmaceutical Management Plus (RPM Plus) program (now Strengthening Pharmaceutical Systems, SPS) implemented by Management Sciences for Health, a self-assessment and quality improvement approach (shown graphically in annex 1) for district and provincial hospitals was developed. The approach uses an infection control self-assessment tool (ICAT) of 21 modules (listed in annex 2) and rapid cycle quality improvement (RCQI) methods (annex 3) to identify problems and orient the development and implementation of low-cost interventions. The ICAT modules cover various aspects of hospital IC or potential sources of infection including hand hygiene, waste management, and labor and delivery. Each individual module contains questions and checklists for self-assessment, a scoring system, and notes for reference outlining the current internationally recognized practices. The ICAT is used as a diagnostic and evaluation tool as part of the RCQI method. The involvement of staff of different disciplines in the approach and the creation of a network between and within hospitals to share and exchange ideas and practices to facilitate implementation are crucial strategies of the approach. With time and continued monitoring, the approach aims to improve IC practices and thereby reduce the rate of nosocomial infections.

The Ministry of Health (MoH) of Guatemala adopted this approach as a means to improve quality of care in the hospitals and later in secondary level facilities. The approach was seen as a means to strengthen the technical capacity and empower the IC committees. With the assistance of SPS, funded by USAID, a technical working group in the MoH Vice Ministry of Hospitals (VMH), and later another technical working group within the Sistema Integral de Atencion de Salud (SIAS), oriented hospital and facility staff in the application of the approach. With continued supervision and support from the central-level MoH teams, hospitals and health facilities implemented the approach, designed interventions, and monitored their progress despite the resource crisis in the health sector at the time. SPS, funded by USAID, facilitated and supported this process from 2008 – 2011 with Guatemala USAID mission funding for three years (FY08, 09 and 10) totaling USD 425,000.

SPS was careful to coordinate with and communicate progress to other players in the field such as other USAID funded projects (Capacity, Calidad en Salud, and Health Care Improvement Program (HCI)) as well as World Bank-funded projects.

In addition, complementarity and synergy between the activities in Guatemala of the STOP AI project, funded by USAID and implemented by MSH, were sought to benefit the activities of both programs ensuring a solid base of IC practices in the hospitals.

## GOAL AND OBJECTIVES

The goal of SPS technical assistance in Guatemala was to raise awareness of infection prevention and to reduce the rate of nosocomial infections in MoH facilities, thereby contributing to an improved quality of care in these health facilities.

**Technical objective:** Improve practices of IC in the national hospital network and five CAIMIs (Centro de atención integral materno-infantil = health centers attending deliveries and including cesarean section and inpatient services).

### Specific Technical Objectives

- Strengthen the technical capacity of IC committees
- Improve waste management practices
- Improve hand hygiene practices

It is expected that the approach would have impact on maternal and child health due to the susceptibility of this group in a hospital or health facility setting, although this was not measured.

Initially it was hoped to document a reduction in the rate of nosocomial infections, however after attempting a baseline measure of the rate of nosocomial infections for each hospital at the start of the project, we realized that the information was scanty and inaccurate. Instead the focus was turned to developing a set of guidelines to improve surveillance of nosocomial infections in hospitals.

While the overall goal was to contribute to an improved quality of care in the hospitals, this was not possible to measure.

## **BACKGROUND: PILOT PHASE**

A successful pilot in five Guatemalan hospitals was conducted in 2007 and 2008, supported by RPM Plus and financed by USAID, using regional infectious disease funds through the South American Infectious Disease Initiative (SAIDI) and core AMR funds.

Drawing from experiences and lessons learned in African Countries, RPM Plus collaborated with the Guatemala MoH Hospital Technical Assistance Unit to provide technical assistance to apply the approach in five pilot hospitals in Guatemala; Amatitlan, Coatepeque, Escuintla, Quetzaltenango, and Quiche. Members of the hospital IC teams attended an implementation workshop in November 2007 to be oriented in the ICAT and continuous quality improvement approach. In the following months, the hospital teams, with support from the local consultants, RPM Plus staff, and MoH, developed and implemented IC quality improvement plans in certain areas of IC, monitoring indicators to track their progress. A review workshop held in July 2008 gave the pilot hospital teams an opportunity to share their activities and results of several months of implementation with each other. Examples of the results: Percentage of staff who washed hands according to procedures improved on average from 23% to 77% three months post-intervention. Availability of hand washing supplies rose from 36% at baseline to 84%. The results are shown in annex 4. Each hospital demonstrated improvements in limited areas of interventions, although they recognized the need for scale-up to other areas of the hospital as well as to ensure sustained results. The IC committees felt strengthened and empowered by the presence of tools to use in their work and that the data served as a powerful advocacy tool to directors and administrators who became more involved. Scale-up plans were drafted and discussed with other participants at the end of the workshop. The central MoH hospital coordination team embraced the ICAT approach as useful to strengthen the hospital IC committees, recognized the value of the approach in complementing on-going IC activities and played a leading role in the workshop.

As a result of the pilot, the VMH of MoH decided to adopt the standardized approach to improve IC practices in its 43-hospital network by using a Guatemalan version of the tool as well as to update the MoH IC protocols. This was the start of the SPS activities funded by USAID Guatemala.

## EXPANSION IN HOSPITAL NETWORK

### Activities

A team of four facilitators from the VMH was trained in April 2009 to orient the 43 hospitals in the standard approach of application of the Guatemalan ICAT combined with the RCQI methods. After an official launching in April 2009 by the vice minister of hospitals, regional training sessions were conducted in July-September 2009 to orient the IC teams from each of the 43 hospitals in the approach and methodologies. The training sessions allow the participants to practice the techniques in a hospital setting. The teams were encouraged to involve as many different disciplines as possible for maximum effect. A total of 171 people were trained (115 female and 56 men): 33% were medical doctors and 47% nurses, as shown in annex 8.

The hospitals then identified their weak areas by using the ICAT, developed a plan to improve IC practices, and implemented interventions such as developing guidelines and posters and improving availability of supplies. Examples of different interventions are shown in annex 5. The ICAT standard approach promotes the use of RCQI to show progress and each hospital developed indicators to measure progress on the specific interventions developed. The hospital team was charged with monitoring the specific indicators on a frequent basis, e.g., every one or three months and repeating the evaluation of the modules each year.

SPS provided support in printing posters to orient hospital staff in the importance of waste classification and separation (annex 6). In May 2010, a total of 11,500 posters (1,500 posters of sharps, 1,100 posters of special waste, 6,700 posters of common waste, and 2,200 posters of contaminated waste) were distributed to the 34 hospitals of the network (79%) which had received no previous assistance on waste classification and to five hospitals where the Capacity project had provided some but not sufficient posters. The quantity distributed to each hospital was calculated with the VM of hospitals according to need, size of hospital, and presence of other implementing partners. The posters were laminated to protect them from dirt and to allow them to be wiped clean. A further 2,500 posters (500 posters of sharps, 500 posters of special waste, 1,000 posters of common waste and 500 posters of contaminated waste) were produced in May 2011 for distribution to new hospitals and to hospitals where the amount of posters required had been underestimated.

As a complementary activity under the STOP AI project, implemented by MSH, further trainings were conducted in the hospitals network promoting IC as well as specific aspects of Influenza management. These workshops were conducted between February and September of 2010 with the same VMH technical group as facilitators, providing an ideal opportunity to follow up on the previous IC trainings and implementation of action plans. The workshops are documented under the STOP AI reports.

Additionally a donation of 60 gel dispensers (45 from SPS and 15 from Stop AI) was provided to one hospital in Guatemala City to highlight the importance of hand washing. The dispensers were re-used with a hospital-produced formula after the first supply ran out. The dispensers were implemented in the intensive care units of the hospital. Over three years, the hospital has seen an

increase of hand washing in pediatric intensive care unit from around 20% of providers observed to over 50%- this result has remained constant.

MoH's VMH requested technical and financial assistance to develop a protocol of surveillance of nosocomial infections as a gap was identified in surveillance; it was not possible to obtain reliable data on the rate of nosocomial infections in the hospital network. The protocol was developed by a working group of the VMH with SPS support and the process started collaboratively with the national center for epidemiology (CNE). Over time, however, it became more difficult for the VMH to work with the CNE and the VMH decided to complete the protocol alone as a VMH document. The protocol provides clear definitions and guidance to hospital teams on the infections to track and how to report.

Parallel to the protocol for nosocomial infection and responding to a need identified by MoH, a guide for prevention and control of nosocomial infection was developed, intended as an update to the norms for IC produced in 2000. The designs for the covers of the two documents were developed by the communications unit of MoH with the technical staff from the VMH and SPS. After a series of reviews within the VMH and by the Capacity project, both documents were approved by the vice minister of hospitals and signed by the minister of health. The protocol for surveillance and the guide for prevention and control of nosocomial infections were printed through support from SPS.

The hospital epidemiologists and directors were oriented in the protocol for surveillance and indicator monitoring in a meeting in the Hotel Villa Espanola, Guatemala City on November 30, 2011. During that meeting four copies of the protocol for surveillance of nosocomial infections and the guide for prevention and control of nosocomial infections and one CD with electronic versions of both documents were distributed to each hospital. The participants came from 28 of the 45 hospitals (62%) and were represented with 62 people (40 female and 22 male) from hospitals and 19 from the MoH central-level VMH for a total of 85 participants including two SPS, one USAID, and one URC staff. Participants from the hospitals included directors, epidemiologists, and head of nursing or their representatives. The documents for the remaining hospitals were left with the MoH VMH for distribution, which was completed by the end of January 2012.

## **Supervision and Systematization**

From the outset of the technical assistance provided by SPS to the VMH, it was agreed that the follow-up and monitoring would be provided by the hospital coordinators from the VMH who are responsible for supervision of the hospitals, with technical support from SPS so as to not create a parallel system. SPS worked with the team of coordinators to develop and test a supervisory checklist and to support and monitor the hospital progress. Due to a number of limitations in the VMH, such as limited access to vehicles and fuel, the hospital supervisors were not able to travel to their hospitals as hoped and due to conflicting priorities in the VMH itself they were not even able to systematically provide follow-up to the hospitals by phone. While some hospital coordinators visited some of their hospitals during the project time, the visits were often for other emergency issues and time did not allow for follow-up on IC.

To stimulate and support the hospitals SPS planned to accompany hospital coordinators from the VMH on follow-up visits to the 32 hospitals of the network that did not have support from the Capacity project. Due to constraints in the availability of the hospital coordinators, only 11 of the 32 hospitals of the network were visited: Ortopedia y rehabilitación, Puerto Barrios, Infantil de Puerto Barrios, Infectología, Tiquisate, Escuintla, Retalhuleu, Salamá, La Tinta, Fray Bartolomé de las casas, and Cobán. During the visits conducted between June and October of 2011, instructions on monitoring indicators were presented, the initial quality improvement plan was reviewed and the progress discussed. The hospital coordinators participated very actively in the process and recommendations were provided by them and the SPS staff at the end of the visit.

In order to facilitate the monitoring process and support the hospital IC teams, SPS helped to develop a monitoring guide in consultation with the Capacity project with a view to institutionalize the monitoring of key IC practices. The monitoring guide was printed as an annex of the revised protocol for surveillance of nosocomial infections, also supported by SPS, funded by USAID, and was distributed to all hospitals in December 2011. Six key indicators of basic infection prevention practices are provided in the guide with the measuring methodology and a reporting form to send their indicator results each month to the IC focal person in the VMH hospitals. The focal person will follow up with the hospital coordinator if the results are not complete or not sent on time. Unfortunately, the surveillance protocol was very delayed because of conflicting priorities in MoH and was only produced at the end of the period of SPS support to MoH, and so SPS was not able to support the actual monitoring process. However, SPS received reports that hospitals were sending their monitoring reports, but that the financial crisis was affecting all the indicators that required supplies (e.g., percentage availability of hand washing supplies (as shown in the report from La Tinta in annex 7). SPS support ended one month after the dissemination of the monitoring process and so no more results of the monitoring are available to SPS.

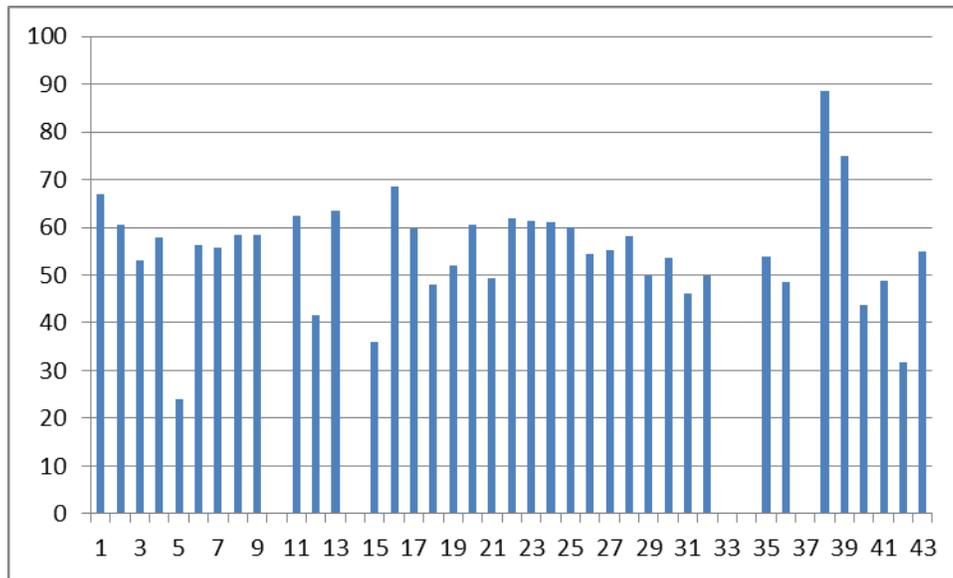
The VMH team wanted to use the ICAT application as an annual evaluation tool and requested the hospitals to apply the modules each year. This was an activity that the VMH conducted without SPS support and shows the commitment of the VMH team in this area. The baseline measurement was conducted in the network between November 2009 and January 2010. Repeat measurements were collected in December 2010 and December 2011.

Because of the impending change of government and the end of the project, SPS left documented procedures and an active IC team at the central level in the VMH. A coordinator for IC at the central level had been appointed and each hospital had an active IC committee, which was not the case at the start of the SPS activities.

The experience of applying the ICAT and quality improvement methods in Guatemala was presented in the International Conference for Investigating the Use of Medicines (ICIUM) in Turkey in November 2011 as a poster, “Implementing a Self-Assessment and Continuous Quality Improvement Approach to Improve Hospital Infection Control Practices in Africa and Latin America”.

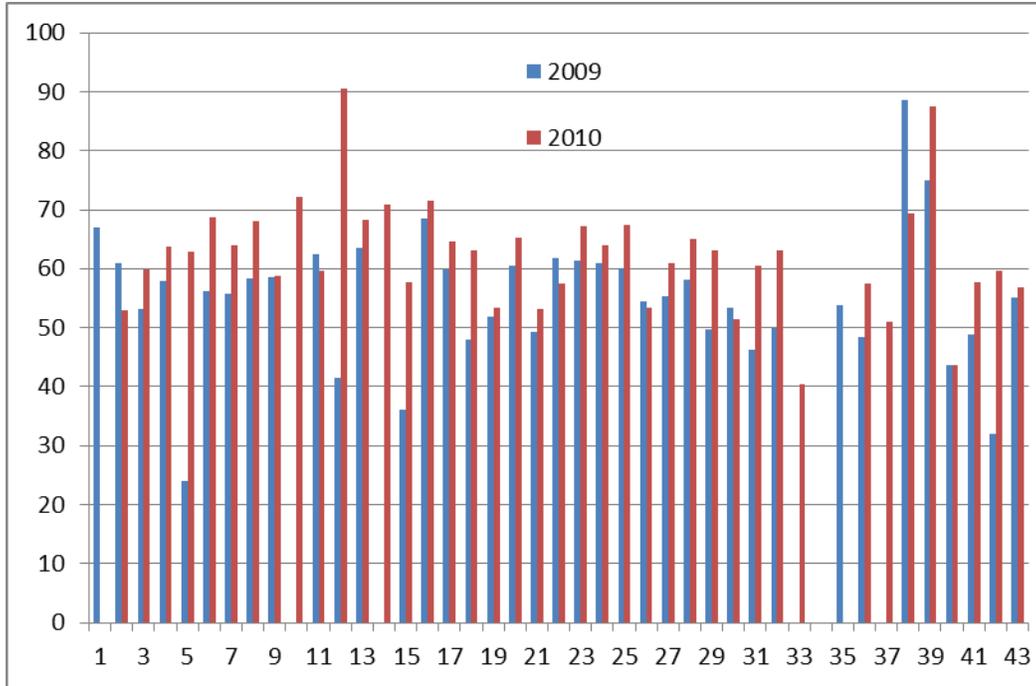
## Results in Hospitals

Each hospital applied some of the modules of the ICAT as a baseline between November 2009 and January 2010. Only three hospitals applied all 20 modules and 38 of 43 hospitals applied an average of 12 of the 20 modules of the tool as a baseline evaluation, with an average score of 55%. The lowest average score was 24% in Escuintla Hospital where they applied 19 modules and the highest average score (89%) was in the hospital of Infectious Diseases in Guatemala City where they applied 18 modules. Figure 1 shows the average score for all the modules applied in each hospital.



**Figure 1. Results of the application of the modules as a baseline (2009)**

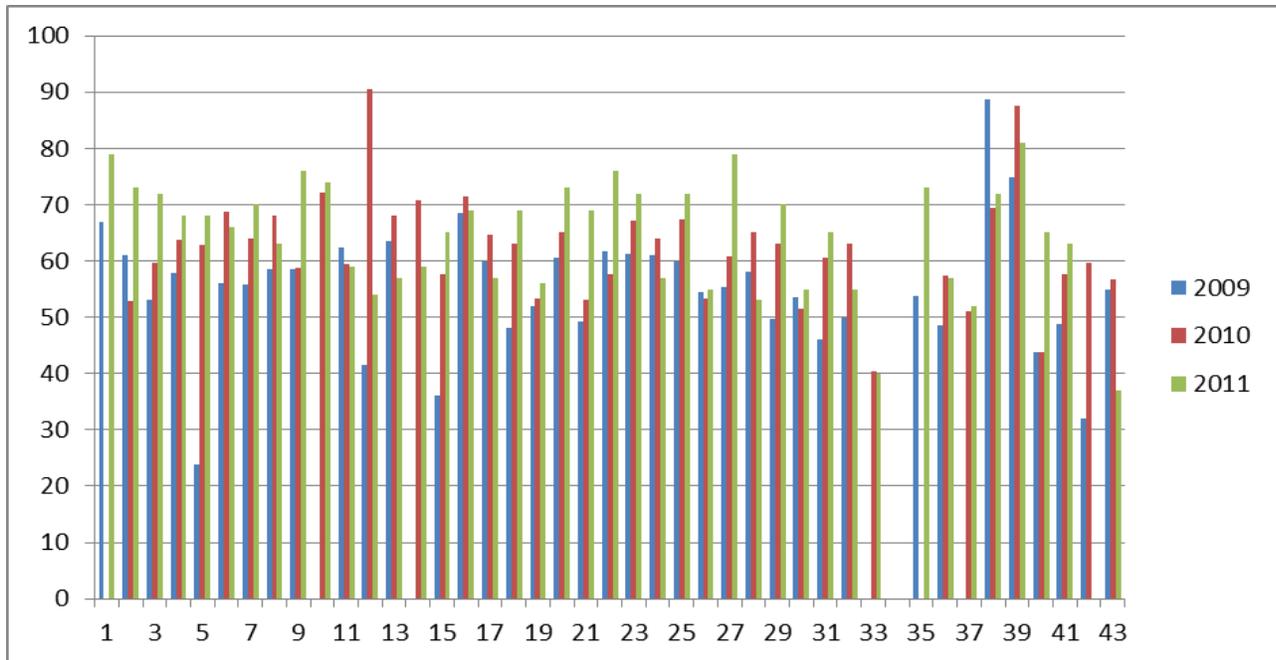
One year later, the hospitals repeated their application of the ICAT modules and an improvement was found, as shown in figure 2.



**Figure 2. Average score of ICAT modules applied in hospital network in 2009 and 2010**

In most hospitals the average score was higher in 2010 than in 2009. The overall average score of all hospitals was also higher than the previous year at 63% compared to 55% and more hospitals participated (40 of 43). The average number of ICAT modules applied per hospital was 16, also an increase from 2009. The lowest average score for a hospital (La Tinta) also was higher at 40% (cf to 24% in 2009) where they applied 16 modules and the highest average score was in Sololá where they also applied 16 ICAT modules.

Consecutive measures were made each year for three years and the results of the average score for the modules applied in each hospital are shown in figure 3.



**Figure 3. Average score of the hospitals in Guatemala in 3 applications of the ICAT**

It can be seen in the figure that in general, while the average score is not in the category A of the ICAT classification (75% and above) in many hospitals, there was an overall improvement in the average score over the three years. An average of 17 modules of the 20 in the ICAT tool were applied and the lowest overall score was 37% in the mental health hospital on 11 modules (down from the previous year) and the highest overall average score for a hospital was also down from the previous year at 81% in Fray Rodrigo de las Casas. In this third evaluation, the overall average ICAT score was slightly higher than the previous year at 65% in 41 of the 43 hospitals. This is encouraging as these improvements were possible against a backdrop of severe economic limitations in the hospitals, where supplies were in short supply and staff morale was low.

The results show that due to the project activity, there is an increased awareness of IC in the hospital network and that staff at both VMH and hospital levels are aware of the importance of evaluating progress.

Comparison of specific modules was made over the three measurements as shown in figure 4, rather than just looking at the average score for all the modules that a hospital applied. These modules were chosen as they are arguably some of the more important given their role in control in infection. An upward trend can be seen over the three years for each of the modules.

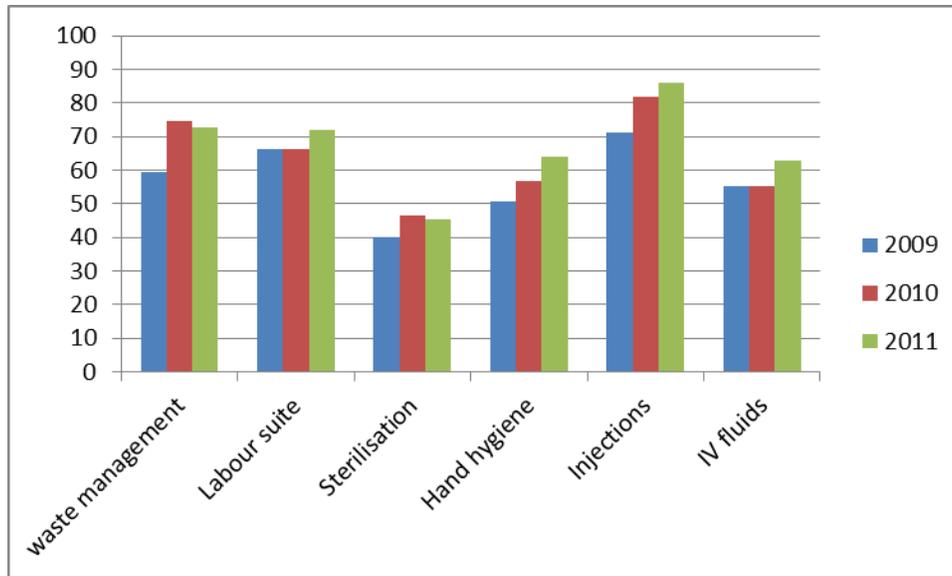


Figure 4. Average score for specific modules over the 3 evaluations

Similarly, it is interesting to review the individual scores for certain modules as shown for example for hand hygiene in figure 5.

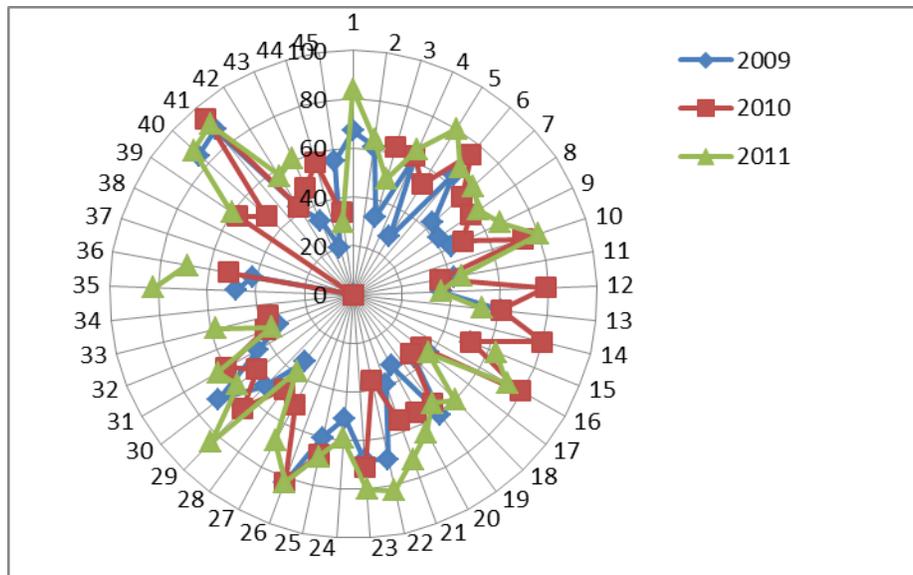


Figure 5. Results of the three evaluations for hand hygiene

The radar plot shows that the scores in year 3 are generally higher than for the two previous years. This same trend was seen for injection practices in figure 6 and labor in figure 7.

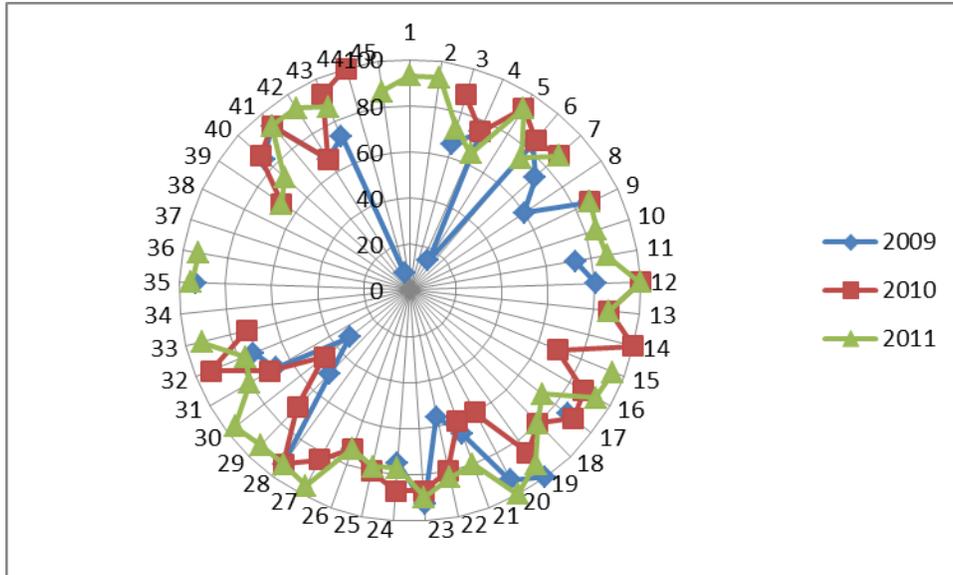


Figure 6. Results of the three evaluations for injection practices

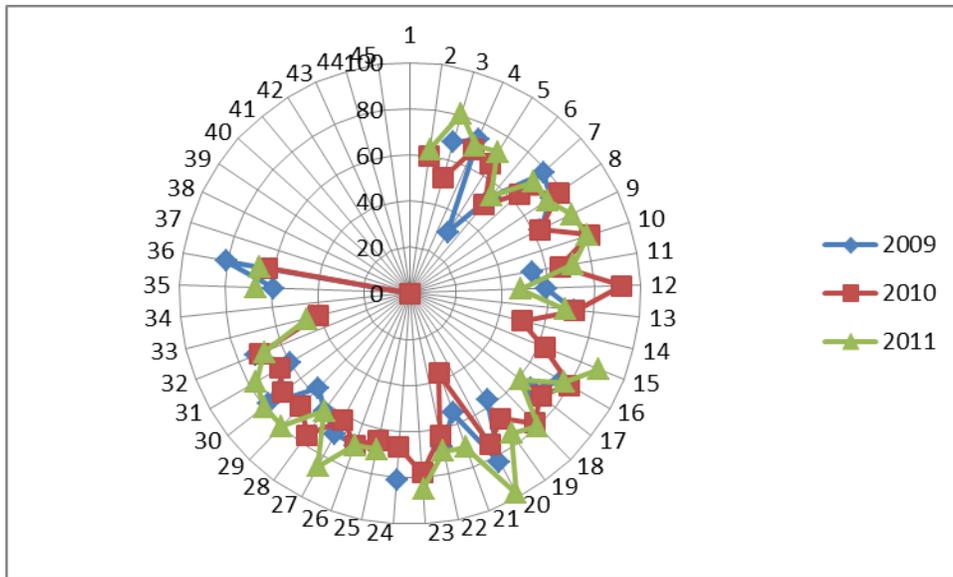
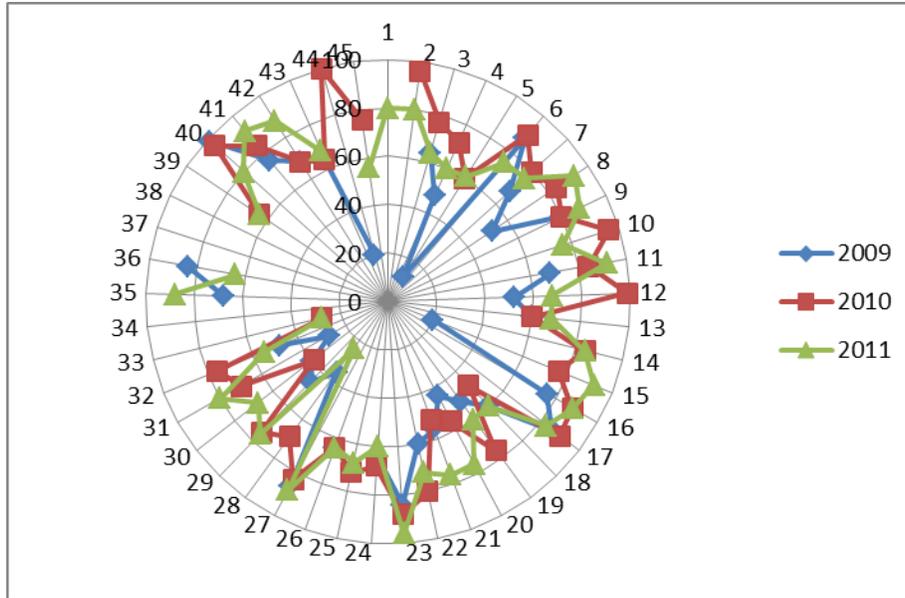


Figure 7 Results of the three evaluations for labor and delivery

The one module that did not show such an improvement in all hospitals was waste management, as shown in figure 8. A marked improvement was seen from the first evaluation to the second, but then in the third, the results were similar or lower than in the second evaluation. The most likely explanation for this is that waste management practices are very dependent on the hospital resources for bags. Given the financial crisis in which MoH found itself during the third year, it is likely that this caused the effect on the module score.



**Figure 8. Results of the three evaluations for waste management**

Another qualitative result is that the VMH designated a coordinator for nosocomial infections at the central level. This reflects the importance that the VMH attributed to nosocomial infections after the start of the project. The role of the coordinator is to follow up on activities and to be responsible for the monitoring and evaluation results.

It has not been possible to measure the rate of nosocomial infections due to weaknesses in the surveillance system. While SPS worked with the technical team of the VMH and the CNE to develop a protocol for surveillance of nosocomial infections, it was only possible to disseminate the protocol at the end of the SPS support and so it was not possible to monitor the infection rate during the project.

## APPLICATION IN SECONDARY-LEVEL FACILITIES

The primary health care section of MoH, the SIAS is responsible for services in health facilities that are not hospitals. Given the importance of IC in these facilities, there was interest in adapting the hospital ICAT to the health facility setting as a means of reducing the facility-acquired infections and improving quality of care. There are a variety of different secondary and primary level facilities in Guatemala. It was determined that the type of facility to start in would be the CAIMIs, which are secondary-level health centers that have surgical facilities to perform caesarian sections.

During 2009, discussions were held within the SIAS and a technical team was formed of staff from the unit of supervision and monitoring and evaluation (USME), nursing department, and the department for development of health services to adapt the hospital tool to the environment of the health centers. The final draft version of the ICAT for secondary-level facilities with its 16 modules was piloted in the five CAIMIs during 2010. A series of five workshops was held to introduce the ICAT to the staff of each of the CAIMIs between July and December of 2010. A total of 226 participants from the five CAIMIs were trained: 13% from the health region office and the remaining 87% from the facilities. During these workshops, each lasting two days, a team of facilitators from SIAS and SPS introduced the staff of the health facility to the methodology and provided each of them with a copy of the tool. The participants tested some modules in their own facility and then developed their own improvement plans. The teams for the regional health office (*area de salud*) were involved to facilitate follow-up in the health facility after the workshop. At the end of each workshop, an IC committee was formed with members designated and the team from the office at the health regional committed to support the CAIMI teams.

Supervisory visits were carried out six months to a year after the initial workshops, between June and September 2011, by a multidisciplinary team from the SIAS consisting of the same staff who had been involved in the initial training activity and SPS. Two days were spent in each CAIMI observing, discussing, and making recommendations. At each of these visits the initial plan and progress were reviewed and posters for classification of waste printed by SPS were distributed. An IC committee was formed in four of the five CAIMIs, although the committee was only active in two CAIMIs and in these same two CAIMIs indicators and repeat evaluations had been conducted. These were the only supervisory visits from a multidisciplinary team of the SIAS and which SPS accompanied; it was agreed that the USME would continue follow-up on IC and prevention as part of their routine supervision of the health regions and the facilities for which a checklist had been developed to guide the USME supervisors. Any recommendations for the facility or the regional health office should be included in the matrix that the USME supervisors use on a routine basis.

During the month of March 2011, SPS received an official request from the director of the SIAS to provide support during an outbreak of facility-acquired infections in the Santa Rosa health region. While the infections seemed to be focused in the hospitals in that department, the SIAS wanted to ensure that they were doing all they could to reduce the chance of facility-acquired infections in the secondary level facilities. A team from the SIAS, accompanied by SPS with

technical and financial support, and also accompanied by staff from the regional health office, visited the eight health centers (*centros de atención permanente* or CAPs) in the department of Santa Rosa. The diagnosis exercise consisted of the application of five modules: hand hygiene, waste management, injections, sterilization and disinfection, and labor and delivery. As a result of the evaluation using the five modules, central level SIAS staff shared the findings with the staff from the facility and then developed a plan of next steps with the regional health office, who committed to improving the situation. As this activity had not been planned in the original work plan, SPS utilized resources from its core AMR funds to respond.

As a result of the workshops with the CAIMIs and the evaluations in the CAPs of Santa Rosa, the ICAT was further modified and a final version of the ICAT for secondary-level services was approved by the vice minister and published with SPS support. SPS was careful to coordinate with MoH and URC project staff to ensure that the document complements the guides produced by the quality management system of MoH for secondary-level facilities (supported by URC). An official launching of the ICAT approach was held in Sololá on 26 August 2011 with the directors and key staff of the health areas to orient them in the use of the ICAT and its quality improvement methodology. The sub-director of the SIAS launched the approach and staff from the USME and the nursing department of the SIAS participated in the meeting. SPS staff did not participate in this activity due to trade union protests causing disruption to the country's road network.

After this official launch, five workshops were held with SPS technical and financial support to orient teams from the 29 health regions in the ICAT and the quality improvement methodology with the objective that the regional health team would replicate the IC activities in the CAPS and other health facilities in their area. Preparatory meetings were held with SIAS staff from the USME, the developing health services department, and the nursing department to prepare facilitator teams for the workshops. The workshops were held between September and December 2011 and a total of 86 health region staff (58% women) were oriented from 27 of the 29 regions – two did not attend.

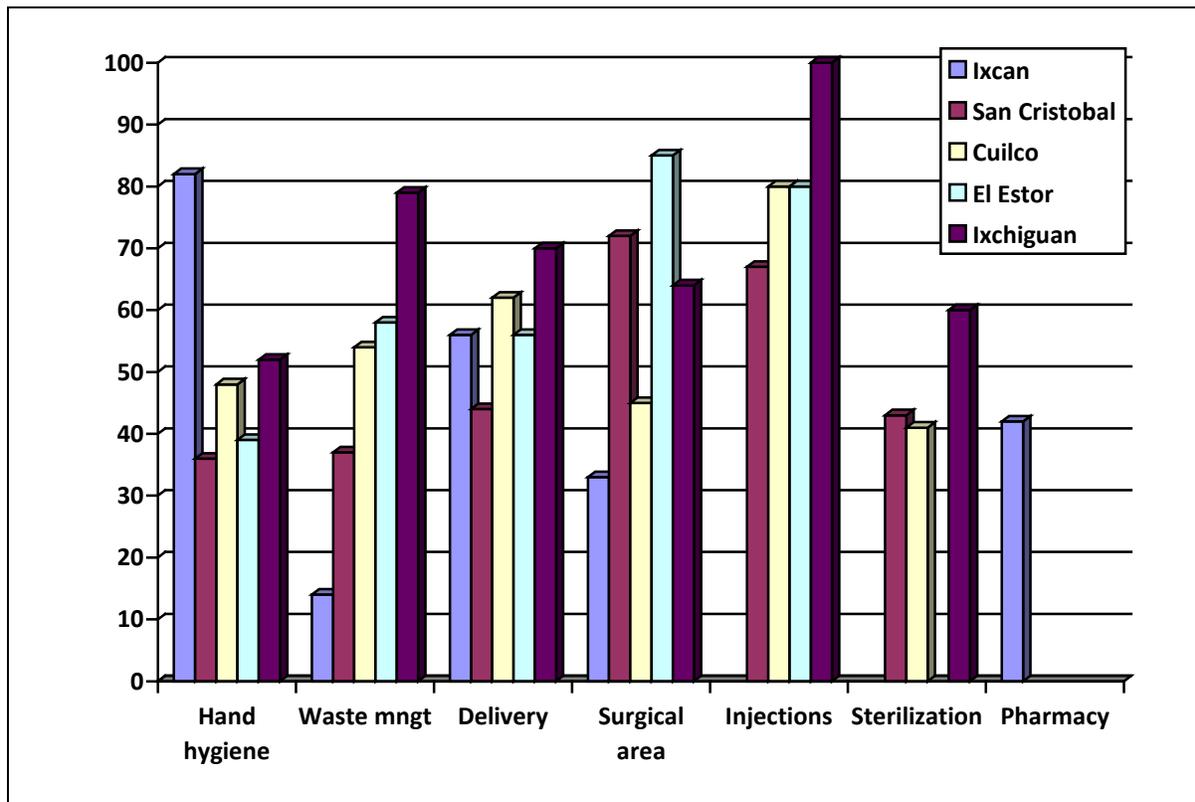
Workshop participants received copies of the evaluation tool and a resource CD. The workshop consisted of a theoretical introduction to the quality improvement approach and the ICAT tool followed by practice applying the modules of the evaluation tool was carried out in a nearby health facility. Finally the teams from each regional health office developed their improvement plans to replicate the process to the CAIMIs, CAPs and other facilities in their areas. SPS provided two copies of the evaluation tool per CAIMI and per CAP for each health region and a package of posters on classification of waste for each CAP, the CAIMIs having previously received posters. A total of 550 copies of the assessment tool were distributed and 6,400 posters on waste classification for 178 CAPS and five CAIMIs.

A monitoring system was established to monitor progress in key infection prevention indicators such as % of staff washing their hands correctly before and after contact with patients. The indicators and instructions on how to calculate them, etc. were included in the ICAT for secondary-level facilities. The indicators should be reported to the regional health team and reviewed by the USME supervisors in their supervisory visits. At the end of the SPS project, these indicators were being reviewed in the SIAS to include in the national information and

monitoring system (*sala situacional*). Unfortunately, because of delays in the project implementation due to MoH conflicting priorities, SPS was not able to provide assistance to the SIAS team to monitor the indicators. At the end of the project support, only two CAIMIs had conducted repeat measurements of the ICAT modules and started to measure the monitoring indicators.

### Results from CAIMIs

Each CAIMI team applied some modules in the initial training. The results are shown in figure 9.



**Figure 9. Results from the initial application of ICAT modules in the training session**

A huge variation was noted in the module scores between CAIMIs and between modules. It is important to note the challenge that El Estor faced as they were not in their actual health facility but in a temporary site while the CAIMI was being rehabilitated. Despite this, their scores were no worse than other CAIMIs.

The average scores for each module, in table 1, show that there in general practices are inadequate in the CAIMIs and need strengthening. Only the modules on injections received a good score.

**Table 1. Average Scores for each Module Applied in CAIMI Training**

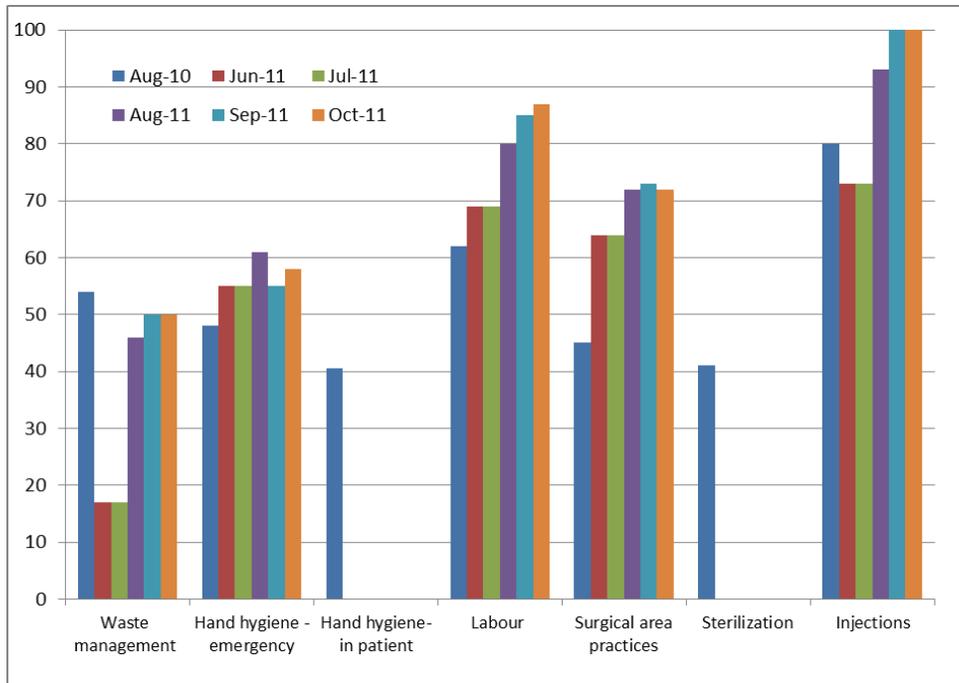
Module	Average	Classification
Hand hygiene	51% (n=5)	B
Waste management	48% (n=5)	C
Delivery room	58% (n=5)	B
Surgical area practices	60% (n=5)	B
Injections	82% (n=4)	A
Sterilization and disinfection	48% (n=4)	C
Pharmacy	42% (n=1)	C

The results from the evaluation in Santa Rosa department are shown in table 2. These results show the importance of improving IC and prevention practices in secondary level facilities.

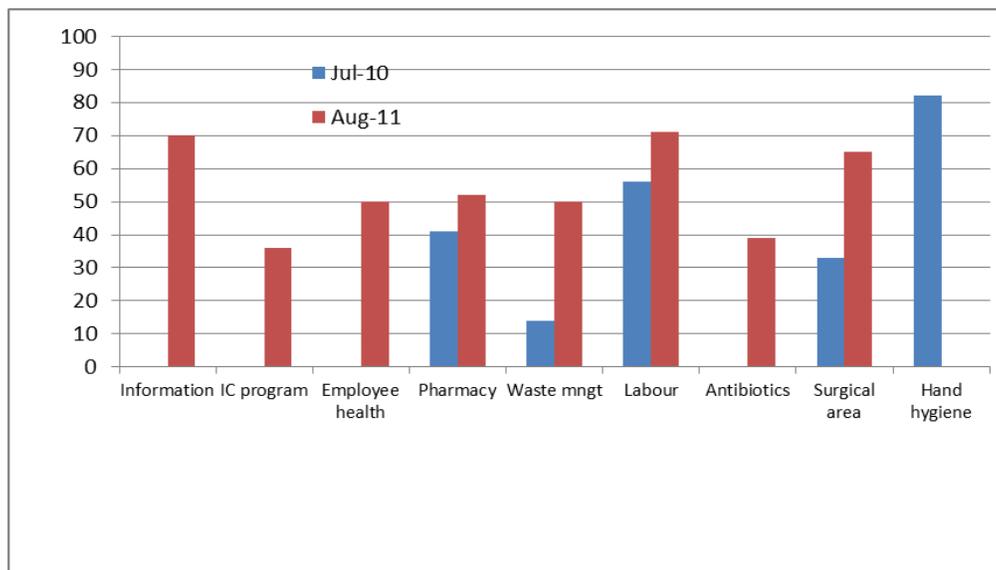
**Table 2. Results from the Evaluation of Eight CAPs in Santa Rosa (%)**

CAP	Disinfection and sterilization	Labor and delivery	Hand hygiene	Waste management	Injections
San Rafael las Flores	32	59	18	4	73
Barberena	30		45	0	80
Taxisco	41	61	51	17	73
Chiquimulilla	28	40	39	33	73
San Juan Tecuaco	23		45	42	93
Sta. María Ixhuatán	33		42	6	80
Nueva Santa Rosa	29	57	42	0	73
Cuilapa	43	54	36	0	73
Average	32	54	40	13	77
<b>Classification</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>A</b>

Only two CAIMIs repeated the application of the modules after a year, as an evaluation of the results are shown below in figures 10 and 11. Both CAIMIs showed vast improvements in the module scores. In fact, in the CAIMI of Cuilco the staff got very excited and applied the modules monthly showing improvements. They were then oriented to measure monitoring indicators instead of the modules on a monthly basis.



**Figure 10. Repeated evaluation using ICAT modules: CAIMI Cuilco**



**Figure 11. Repeated evaluation using ICAT modules: CAIMI Ixcan**

The CAIMIs were recommended to monitor key indicators on a monthly basis as outlined in the secondary level facility ICAT rather than repeat the modules so frequently. Again in the time of SPS support, only two CAIMIs sent data to the USME charged with monitoring at central level. The data are shown in figure 12.

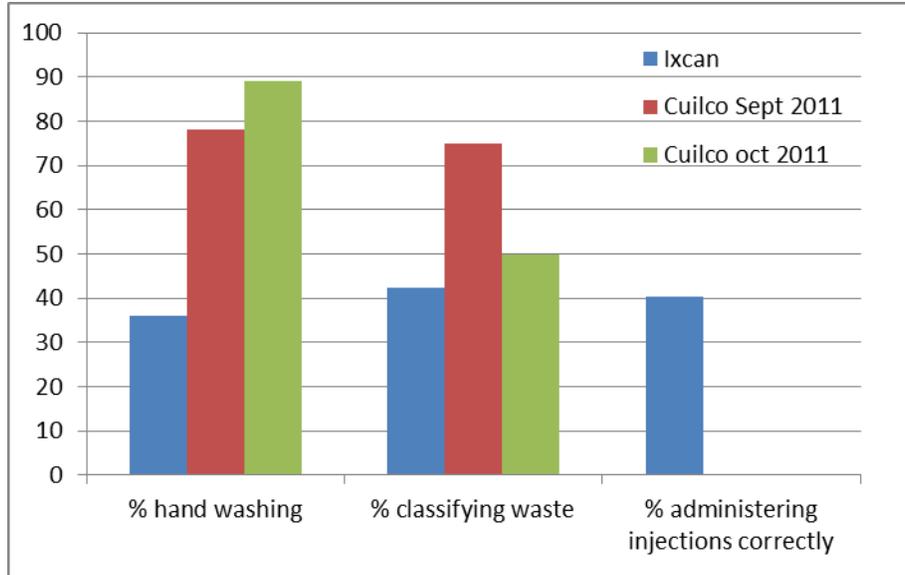


Figure 12. Indicator measurement in 2 CAIMIs

## OVERALL RESULTS

Along the life of the portfolio, SPS was monitoring progress contributing to the operation plan indicator if USAID Guatemala. The achievements in those indicators are shown in table 3.

**Table 3. SPS Contribution to USAID OP Indicators**

Indicators/targets	Target 2009	Achieved by July 2010	Target 2010	Achieved by Dec 2011
Number of new approaches successfully introduced	1	1 ICAT introduced in hospital	1 (additional)	1; ICAT adapted to secondary-level facilities and implemented in CAIMIs and regional health teams oriented to implement in CAPs
Number of improvements to laws, policies, regulations, or guidelines related to improved access to and use of health services drafted	3	1 (ICAT)	2 (carried over from 2009)	Surveillance document and norms for IC produced and disseminated to hospital network in Nov 2011
Number of service delivery points implementing quality assurance/quality improvement (QA/QI) approaches	7 hospitals	43 oriented	4 CAIMIs	5 CAIMIs oriented

## Results of Performance Framework from Workplans

Tables 4, 5, and 6 show the annual performance frameworks with results of the element indicators where possible.

**Table 4. Performance Framework Year 1: 2008-2009**

Activities	Products and other outputs	Outcomes	Element indicators	Results
2 Revision of the medical waste module and finalization of the Guatemalan version of the ICAT tool	<ul style="list-style-type: none"> <li>Finalized modules on hand washing, medical waste disposal and isolation</li> <li>Guatemala version of ICAT</li> </ul>	Hospitals have access to material to conduct self-assessments of IC practices	Number of copies of Guatemala ICAT printed and distributed to MoH	400 manuals and assessment tools printed and distributed
3 Train the hospital staff in the use of the ICAT tool and quality improvement methodology	<ul style="list-style-type: none"> <li>Training materials for TOT and hospital trainings</li> <li>Reports of trainings</li> </ul>	Hospitals trained in conducting self-assessment of IC practices and rapid-cycle quality improvement method	<ul style="list-style-type: none"> <li>Number of trainers trained</li> <li>Number of hospital staff trained</li> <li>% coverage of staff of the USAID/Guatemala priority regions</li> <li>1 new approach successfully introduced</li> </ul>	4 trainers trained; 171 hospital staff trained; all 43 hospitals in the network participated in the workshops
4 Monitoring of the activities in the hospitals	<ul style="list-style-type: none"> <li>Each hospital has an IC plan with defined indicators</li> <li>Monitoring guides</li> <li>Checklists</li> <li>Reports of monitoring</li> </ul>	Hospitals monitoring their indicators over time in hand washing and waste disposal	<ul style="list-style-type: none"> <li>Rate of nosocomial infections</li> <li>Use of antibiotics for nosocomila infections</li> <li>Cost of managing nosocomial infections</li> <li>% of staff washing hands appropriately before and after patient contact</li> <li>% of hospitals with correct medical waste disposal practices</li> </ul>	None of these indicators were possible to measure
Baseline and final evaluation of the rate of nosocomial infections	<ul style="list-style-type: none"> <li>Request for information sent to each hospital</li> <li>Table of data completed for each indicator for each hospital</li> <li>Data incorporated into</li> </ul>	Baseline and final (end of year) data on rate of nosocomial infection for each hospital in Guatemala	<ul style="list-style-type: none"> <li>Rate of nosocomial infections (per hospital, per type of infection, per service)</li> <li>Use and cost of antibiotics for</li> </ul>	Due to lack of surveillance system, this was not possible to measure

*Infection Control in Guatemala: Life of Project Report 2008-2011*

<b>Activities</b>	<b>Products and other outputs</b>	<b>Outcomes</b>	<b>Element indicators</b>	<b>Results</b>
	surveillance system for nosocomial infections		nosocomial infections • Costs associated with managing nosocomial infections	
5 Develop, field test and disseminate materials promoting IC practices.	<ul style="list-style-type: none"> <li>• Posters produced by each hospital</li> <li>• Winning poster at national level</li> </ul>	Hospitals motivated to develop materials	<ul style="list-style-type: none"> <li>• Number of posters produced</li> <li>• Number of hospitals participating</li> </ul>	11500 posters distributed to 34 hospitals
6 Support to MoH in revising the surveillance system for nosocomial infections	<ul style="list-style-type: none"> <li>• Revised forms and protocols</li> <li>• Guidance for supervisors</li> <li>• Formal launch by MoH</li> </ul>	Surveillance system for nosocomial infections improved	<ul style="list-style-type: none"> <li>• Number of hospital reporting nosocomial infection rates</li> <li>• Improvement to guidelines related to improved access to and use of health services</li> </ul>	Not completed
7 Support to MOH in revising the IC norms	Revised IC norms	Resource available to hospitals on the best practices	<ul style="list-style-type: none"> <li>• IC norms revised</li> <li>• Improvement to guidelines related to improved access to and use of health services</li> </ul>	Not completed
8 Work with the bilateral URC/Calidad en Salud to implement the IC module	<ul style="list-style-type: none"> <li>• IC module</li> <li>• Module incorporated into the URC package</li> </ul>	Module on key aspects of IC such as hand hygiene and waste disposal integrated into the QI package in all facilities in 7 departments	Defined indicators of the module maintained at over 80% by the participating facilities	8 indicators defined
9 Explore the possibility to use the ICAT and QI approach in the CAIMIs and in APROFAM	Documented discussions with MoH and APROFAM	Plans to adapt and pilot ICAT in the CAIMIs; planned activities to orient the staff of APROFAM in the ICAT and QI approach		ICAT work was presented to APROFAM in Jan 2011

Table 5. Performance Framework Year 2: 2009-210

Activities	Products and other outputs	Outcomes	Element indicators	Results
2 Introduction of ICAT and quality improvement approach to primary-level health facilities	<ul style="list-style-type: none"> <li>Revised ICAT if necessary</li> <li>Training materials for TOT, trainings of area de salud staff and CAIMI staff</li> <li>Reports of trainings:               <ul style="list-style-type: none"> <li>TOT</li> <li>Area de salud teams</li> <li>CAIMI staff</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Key staff from each area de salud trained in conducting self-assessment of IC practices and rapid cycles of quality improvement method</li> <li>Staff from at least one CAIMI implementing the QI approach to IC</li> <li>IC plan developed at the area de salud and CAIMI levels</li> </ul>	<ul style="list-style-type: none"> <li>Number of trainers from central level SIAS trained</li> <li>Number of area de salud staff trained</li> <li>Number of CAIMIs involved in the process</li> <li>Number of CAIMI staff trained</li> <li>1 new approach successfully introduced to CAIMIs</li> </ul>	<ul style="list-style-type: none"> <li>6 trainers at central level for CAIMI training</li> <li>86 staff from regional health office oriented in approach</li> <li>5 CAIMIs implemented the approach</li> <li>226 staff trained for implementation in CAIMIs</li> </ul>
3 Continued technical assistance in the monitoring of hospitals activities	<ul style="list-style-type: none"> <li>Each hospital has an IC plan with defined indicators</li> <li>Reports of monitoring visits by consultant</li> <li>Monitoring of module results and key indicators related to hand hygiene posted on MoH intranet</li> </ul>	Hospitals monitoring their indicators over time in hand washing and waste disposal	<ul style="list-style-type: none"> <li>Rate of nosocomial infections</li> <li>Data on use of antibiotics for nosocomial infections</li> <li>% of staff washing hands appropriately before and after patient contact</li> <li>% of hospitals with correct medical waste disposal practices</li> </ul>	Surveillance data not available; protocol still being developed
4 Support to MoH in revising the IC norms	Revised IC norms	Resource available to hospitals on the best practices	<ul style="list-style-type: none"> <li>IC norms revised</li> <li>Improvement to guidelines related to improved access to and use of health services</li> </ul>	In progress
5 Develop and field-test materials promoting IC practices	<ul style="list-style-type: none"> <li>Posters on waste classification printed</li> <li>Poster on hand hygiene developed or adopted</li> </ul>	Hospitals involved in the development of materials	<ul style="list-style-type: none"> <li>Number of posters produced</li> <li>% of coverage in hospitals with the waste disposal signs at each point of waste disposal</li> </ul>	11,500 posters produced for hospitals; distributed to 34 hospitals as the other 9 were supported by other partners; poster competition only had 2 entries, so was aborted

<b>Activities</b>	<b>Products and other outputs</b>	<b>Outcomes</b>	<b>Element indicators</b>	<b>Results</b>
			<ul style="list-style-type: none"> <li>• Number of hospitals participating in hand hygiene poster development</li> <li>• % coverage of hospitals with hand hygiene poster at each wash station</li> </ul>	

**Table 6. Performance Framework Year 3 2010-2011**

<b>Activities</b>	<b>Deliverables and targets</b>			
	<b>Products</b>	<b>Outputs</b>	<b>Outcomes</b>	<b>Results</b>
1 Supervision and systemization of ICAT and quality improvement approach in secondary level health facilities (CAIMIs)	<ul style="list-style-type: none"> <li>• Monitoring indicators for CAIMIs defined</li> <li>• Reports of supervision visits</li> <li>• Report of orientation workshop for staff from 29 DAS</li> </ul>	<ul style="list-style-type: none"> <li>• Key IC indicators reported by CAIMIs</li> <li>• Results posted to the information platform PISI</li> <li>• ICAT tool available for DAS staff to use in other secondary level facilities</li> </ul>	Improvement in infection prevention practices.	Improvement showed in charts
2 Supervision and systemization of ICAT and quality improvement approach in 32 hospitals of the network	<ul style="list-style-type: none"> <li>• Report of orientation workshop</li> <li>• Reports of supervision visits to 32 hospitals</li> </ul>	<ul style="list-style-type: none"> <li>• Epidemiologists and directors of hospitals aware of new reporting and surveillance systems</li> <li>• Key IC indicators reported by hospitals</li> <li>• Surveillance of nosocomial infection</li> <li>• Results posted to the information platform PISI</li> </ul>	Improvement in infection prevention practices	Monitoring not systematic in hospitals

## ROLE OF MINISTRY OF HEALTH

MoH was key in moving these activities forward and was the driving force behind the activities in both the VMH and in the SIAS. There were many delays in activity progress due primarily to conflicting priorities of MoH and the complicated political environment at the time of implementation: pending change of government, limited financial resources in hospitals, and lack of fuel limited use of MoH vehicles and restricted supervisory visits. However, despite these impediments, the VMH was able to mobilize the hospital IC committees to apply the modules of the ICAT and maintain momentum for three annual evaluations. IC committees became motivated as they were equipped with tools. The delays introducing the monitoring indicators meant that SPS was not able to support that process but there were strong indications that the point person for IC at MoH would facilitate that process and support the hospitals in regular monitoring. Within the VMH, a technical team on IC had formed and would ensure continuity in the next administration; however as SPS was no longer providing technical assistance, it is not known what continued.

In the other arm of MoH, in the SIAS the multidisciplinary team that was formed was dynamic in supporting the CAIMIs in the early stages of the process. The same financial restrictions affected supervision in both sectors, but despite that some CAIMIs were monitoring their progress.

The approach that SPS used was working through MoH while never replacing it. MoH had ownership of the activities and used them as a strategy to improve quality of care in the health facilities.

## COLLABORATION WITH OTHER USAID PARTNERS

Several different partners and projects worked on activities that were related to IC. SPS coordinated with these projects and partners in an attempt to achieve synergistic results for all partners.

- **Stop AI Project**  
SPS coordinated closely with this project and the same team in the VMH carried out trainings in the hospital network on infection prevention and precautions related to influenza. This enabled follow-up in the hospitals in the work to start implementing the ICAT approach.
- **Calidad en salud and later HCI project of URC.**  
SPS coordinated with URC on several activities. Initially both partners had hoped that infection prevention indicators could be incorporated into URC's quality improvement collaborative model, but after a lot of effort developing as few indicators as possible the eight indicators that were developed were considered too much to introduce into the model. The work was nevertheless useful as it contributed to URC's work on accreditation and procedures. Additionally, SPS collaborated with HCI to ensure no duplication in approach and consistency of messages in the guidelines that HCI developed for secondary-level facilities.
- **The Capacity Project of Intrahealth was also working with the VMH to support a limited number of hospitals.** SPS coordinated activities with the Capacity and developed together a set of monitoring indicators to be used in all hospitals. These were included in the surveillance protocol.

Towards the end of the SPS project, SPS participated in discussions on methodologies and areas of collaboration with URC and the Capacity project. However SPS was ending and so was no longer able to participate in the final discussions and presentation of synergies, and differences and recommendations to USAID.

## LESSONS LEARNED

After three years of USAID funded-support to SPS to improve IC practices, SPS left MoH with tools and guidelines to enable it to continue to monitor and improve its IC practices. For the reasons already presented, SPS was not able to end with results demonstrating a reduction in nosocomial infection rates or use of antibiotics or show an increase in key practices such as hand hygiene or waste classification, but the SPS-supported process has dynamized the IC teams in the hospital network and formed IC teams in secondary-level facilities where there were none before and helped to raise awareness of the importance of infection prevention at the central level through a lens of quality of care.

This was only possible with the complete involvement of MoH and in particular of top decision makers within it. For example, the support of the vice minister and the director of the SIAS in these activities was crucial. SPS had frequent meetings with the technical teams both in the VMH and in SIAS which greatly facilitated the coordination; however the naming of a key point person in both sectors was necessary to ease communication. The technical team suffered changes along the life of the project due to staff changes in MoH, but the impact on the activities was minimized because of the number and diversity of people on the teams.

SPS's approach for coordinating with different partners was essential to ensure that MoH perceived the support of a donor as coherent and coordinated. This also allowed for leveraging of resources and synergy of results.

Monitoring and follow-up of individual facilities was limited due to the internal problems in MoH, and while SPS, if given more resources, could have carried out this role, this would have replaced rather than helped support and build the capacity of MoH. Despite this, hospitals and CAIMIs demonstrated improvement in IC practices using the standard approach of the ICAT.

## FUNDING

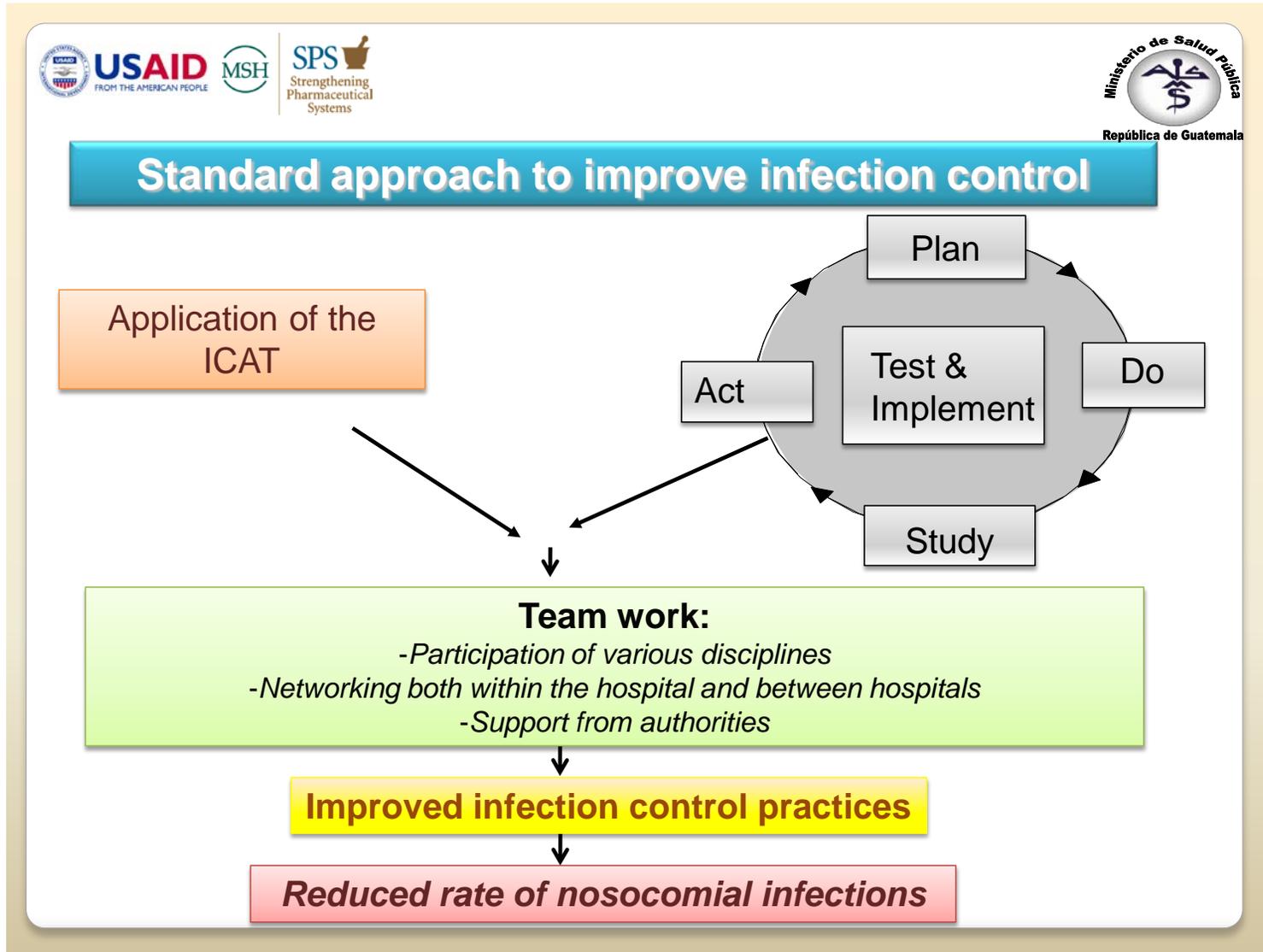
A two-year MAARD of USD 350,000 was awarded by USAID Guatemala to SPS in 2008 to cover the period October 2008 to September 2010. An additional USD 75,000 was awarded in 2011 to allow SPS to continue activities until Sept 2011, which was later extended to December 2011.

Prior to USAID Guatemala funding the pilot activities were carried out under SAIDI funding to RPM Plus project. After the USAID Guatemala funding ended, minimal AMR core funds to SPS were used to document the process. AMR core funds were also used to conduct an evaluation of infection prevention practices in the eight CAPs (centro de atención permanente) of Santa Rosa.

During the project, SPS donated assets to the VMH to enable their work in nosocomial infection monitoring. The items included:

- LG projector
- Laser pointer/slide changer
- Computer: Toshiba Satellite laptop with computer bag with Norton and Microsoft Office Professional

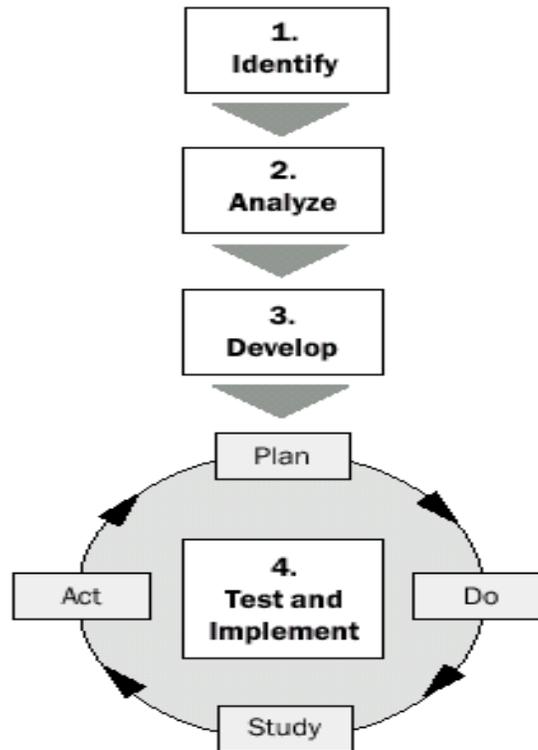
## ANNEX 1. STANDARD APPROACH TO INFECTION CONTROL



## ANNEX 2. MODULES OF THE ICATS

<b>Module</b>	<b>Generic ICAT</b>	<b>Guatemala hospital ICAT</b>	<b>Guatemala secondary-level facility ICAT</b>
1. Airway suctioning	X	X	X
2. Employee health	X	X	X
3. General ward	X	X	X
4. Hand hygiene	X	X	X
5. Hospital Information	X	X	X
6. Infection Control program	X	X	X
7. Injections	X	X	X
8. Intensive care unit	X	X	
9. Intravenous catheters	X	X	
10. Intravenous fluids and medications	X	X	X
11. Isolation and standard precautions	X	X	
12. Labor and delivery	X	X	X
13. Microbiology laboratory	X	X	
14. Pharmacy	X	X	X
15. Sterilization and disinfection: equipment and intravenous fluids	X	X	X
16. Sterilization and disinfection: needles and syringes	X		
17. Sterilization and disinfection: sterile gloves	X	X	
18. Surgical antibiotic use and surgical equipment procedures	X	X	X
19. Surgical area practices	X	X	X
20. Urinary catheters	X	X	X
21. Waste management	X	X	X

## ANNEX 3. RAPID CYCLES OF QUALITY IMPROVEMENT

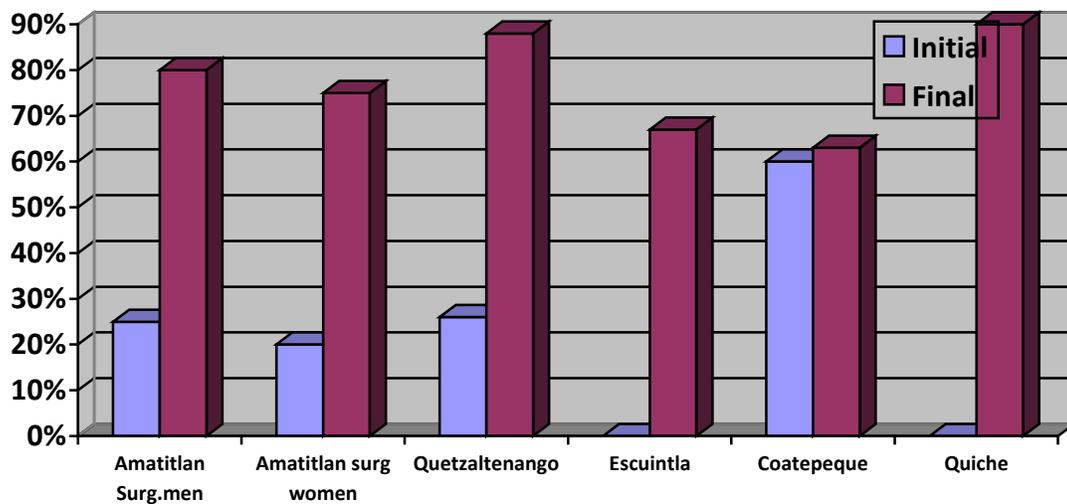


## ANNEX 4. SAMPLE RESULTS FROM PILOT PHASE

### Hand Hygiene Module

Service/hospital	% initial March 2008	Classification (A, B, C)	% final July 2008	Classification (A, B, C)
Amatitlan: Male surgical	47%	C	77%	A
Amatitlan: Female surgical	53%	B	80%	A
Escuintla	57%	B	74%	B
Coatepeque	60%	B	63%	B
Quiche : operating theatre	72%	B	95%	A
Quiche: male surgical ward	42%	C	85%	A
Quiche: ITU	52%	B	90%	A

Hand hygiene indicator: % staff observed who wash their hands after touching a patient



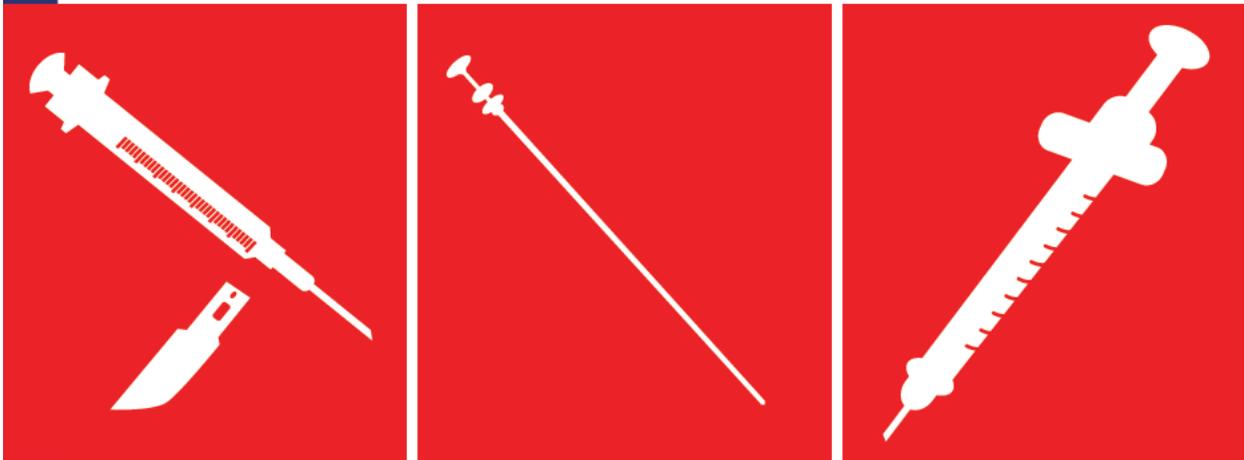
## ANNEX 5. EXAMPLES OF INTERVENTIONS

### Ejemplos de intervenciones en los hospitales



ANNEX 6. WASTE MANAGEMENT POSTERS

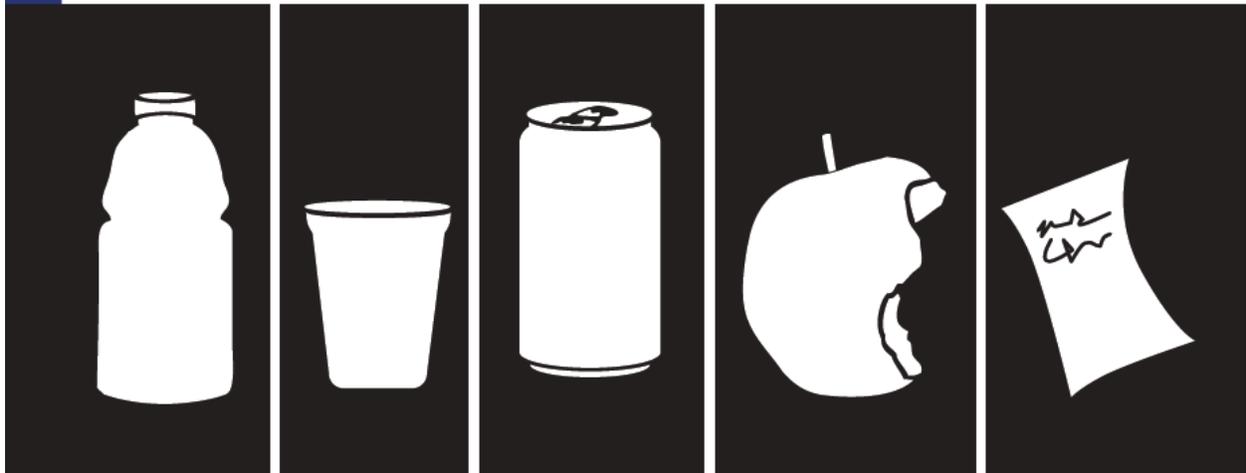
# DESECHOS PUNZOCORTANTES



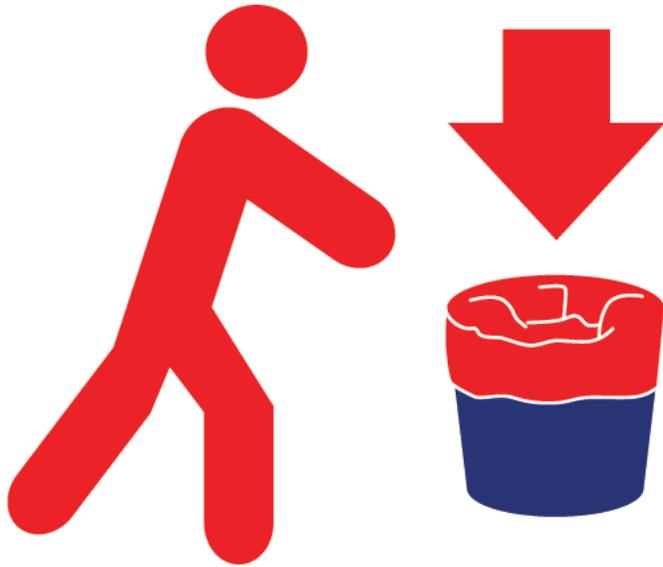
# DESECHOS ESPECIALES



# DESECHOS COMUNES



# DESECHOS BIOINFECCIOSOS



## ANNEX 7. MONITORING REPORT LA TINTA



### MONITOREO EN EL TEMA DE PREVENCION DE INFECCIONES

Hospital: HOSPITAL NACIONAL LA TINTA

Mes y Año: ENERO 2012

No.	INDICADOR	RESULTADO
01	Porcentaje de proveedores de salud que se lavan las manos antes y después de atender a cada usuario/a.	61
02	Porcentaje de servicios que cuentan con los insumos para lavado de manos.	35
03	Porcentaje de servicios que clasifican correctamente los desechos sólidos hospitalarios.	55
04	Porcentaje de servicios que cumplen las normas de bioseguridad al estar en contacto con fluidos y/o canalizar vena periférica.	89
05	Porcentaje de equipos esterilizados revisados que cumple con las normas básicas de esterilización.	98
06	Porcentaje de personal de limpieza observado que utilizan el equipo de protección.	29

Nombre y Firma de quien reporta: LICDA. ETELVINA MILIAN ALVA

Nombre y Firma del Director: DR. GUILLERMO BUENAFE CASTRO

Fecha: FEBRERO 09 DEL 2012



## ANNEX 8. TOTAL PEOPLE TRAINED DURING THE PROJECT

	Dates	Female	Male	Total	Dr	Nurse	aux nurse	Other	Admin	% female	% male	%Dr	% Nurse	% aux nurse	% other	% admin
<b>Hospital TOT</b>	Apr-09	3	1	4	2	1		1		75	25	50	25		25	0
<b>Hospital ICAT training regional workshops</b>																
Zacapa	7-9 Sept 2009	33	17	50	17	19	2	12		66	34	34	38	4	24	0
Quetzaltenango	21-23 Sept 2009	39	17	56	17	31	2	6		70	30	30	55	4	11	0
Antigua	21-23 July 2009	13	16	29	8	12		9		45	55	28	41	0	31	0
Guatemala 1	16-19 June 2009	16	4	20	9	9		1	1	80	20	45	45	0	5	5
Guatemala 2	6-8 Oct 2009	14	2	16	6	9		1		88	13	38	56	0	6	0
<b>Sub total</b>		<b>115</b>	<b>56</b>	<b>171</b>	<b>57</b>	<b>80</b>	<b>4</b>	<b>29</b>	<b>1</b>	<b>67</b>	<b>33</b>	<b>33</b>	<b>47</b>	<b>2</b>	<b>17</b>	<b>1</b>
<b>ICAT training CAIMIs</b>																
Cuilco	17-18 Aug 2010	29	21	50	9	6	12	16	7	58	42	18	12	24	32	14
San Cristobal	10-11 Aug 2010	21	47	68	8	6	29	18	7	31	69	12	9	43	26	10
Ixil	8-9 Dec 2010	25	7	32	4	7	15	5	1	78	22	13	22	47	16	3
El Estor	26-27 Aug 2010	19	14	33	5	5	15	7	1	58	42	15	15	45	21	3
Ixcán	20-21 July 2010	18	25	43	5	6	13	9	10	42	58	12	14	30	21	23
<b>Sub total</b>		<b>112</b>	<b>114</b>	<b>226</b>	<b>31</b>	<b>30</b>	<b>84</b>	<b>55</b>	<b>26</b>	<b>50</b>	<b>50</b>	<b>14</b>	<b>13</b>	<b>37</b>	<b>24</b>	<b>12</b>
<b>Secondary level ICAT regional workshops with regional health office teams</b>																
Zacapa	8-9 Sept 2011	12	9	21	6	7		7	1	57	43	29	33	0	33	5
Quetzaltenango	6-7 Oct 2011	11	7	18	8	3		7		61	39	44	17	0	39	0
Guatemala	29-30 Sept 2011	14	6	20	7	7		5	1	70	30	35	35	0	25	5
Cobán	6-7 Dec 2011	8	6	14	2	6		5	1	57	43	14	43	0	36	7
Solola	21-22 Sept 2011	5	8	13	6	3		4		38	62	46	23	0	31	0
<b>Sub total</b>		<b>50</b>	<b>36</b>	<b>86</b>	<b>29</b>	<b>26</b>	<b>0</b>	<b>28</b>	<b>3</b>	<b>58</b>	<b>42</b>	<b>34</b>	<b>30</b>	<b>0</b>	<b>33</b>	<b>3</b>
<b>Hospitals dissemination of surveillance protocol and infection control guide</b>																
National	30-Nov-11	40	22	62	30	32				65	35	48	52	0	0	0
<b>TOTAL</b>		<b>320</b>	<b>229</b>	<b>549</b>	<b>149</b>	<b>169</b>				<b>58</b>	<b>42</b>	<b>27</b>	<b>31</b>	<b>0</b>	<b>0</b>	<b>0</b>