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His life and her trust are in our hands
INTRODUCTION

With an estimated 25 billion injections administered annually in developing and transitional countries alone, injections are among the most frequently used medical procedures. If delivered unsafely, injections have the potential to contribute to the transmission of bloodborne pathogens with devastating consequences such as disability and death. Unsafe practices and the overuse of injections can cause an estimated 32% of Hepatitis B virus, 40% of Hepatitis C virus and 5% of all new HIV (human immunodeficiency virus) infections every single year2.

The risk of an unsafe injection is not only associated with the patient but also the health care worker (HCW) administering the injection and the community following dangerous waste disposal practices. In 1999, the World Health Organization (WHO) launched the Safe Injection Global Network (SIGN), an international alliance hoping to achieve the safe and appropriate use of injections on a global scale. The Injection Safety programme comprises of three core technical strategies believed to be necessary to bring about an improvement in injection practice. These include;

1. Behaviour change among patients and healthcare workers to decrease injection overuse and achieve injection safety
2. Availability of necessary and of good quality injection devices and supplies
3. Management of sharps waste

Implementation of these strategies will facilitate improved patient safety by preventing the reuse of injection equipment or reducing unnecessary injections; health care worker safety through needle stick injury prevention, provision of Hepatitis B vaccine or post exposure prophylaxis and community safety via safe sharps waste management.

Despite the simple strategies to improve injection safety, many countries still view it as a chronic problem, too complicated to address. Poor practices are being targeted such as preventing the reuse of equipment through the introduction of auto-disable syringes however many challenges still remain. Injection equipment availability, supply and quality are still key issues that need to be resolved to ensure safer injection practices. Patient preference or doctor over-prescription of injectable medications means unnecessary injections are still a major issue. It is estimated that over 70% of injections are unnecessary when oral formulation could have been used as an alternative therapy. To bring about behaviour change is a well-recognized challenge yet it is essential that these issues and gaps in interventions are addressed to ensure improved injection safety throughout the world. Recent evidence suggests that change is possible.

The following database demonstrates intervention success stories that have improved injection safety in both developed and developing countries, proving that positive results are viable in different country settings. Intervention strategies that target all three core components simultaneously have been shown to have the greatest positive effect on improved injection safety.
AFRO

(WHO Regional Office for Africa)
GAVI INJECTION SAFETY SUPPORTED COUNTRIES IN AFRICA (2011)
http://www.unicef.org/media/files/S190.full.pdf

The reuse of disposable and poorly sterilized syringes can result in unsafe injections and lead to infections. GAVI funding was targeted to aid the transition from disposable and sterilizable syringes to auto-disable (AD) syringes in 39 African countries. The measles supplemental immunization activities (SIAs) program enabled 19 (49%) of 39 countries to successfully introduce injection safety equipment (AD syringes, safety boxes, health care worker training and the procurement of safety equipment). 21 countries that had already introduced AD syringes in to their national immunization program received GAVI funding. UNICEF supply data demonstrates that between 1997 and 2008, sub-Saharan Africa AD syringe shipments increased from 11 million to 461 million. By 2004, sterilizable syringe use could not be found in any of the 39 countries. AD syringe procurement and use continued even when GAVI funding and the measles SIAs had finished.

BURKINA FASO (2008)


Burkina Faso was selected as a pilot country for a ‘Focus Project’ as it demonstrated a strong political commitment to improving injection safety. In 2001, a baseline injection safety assessment demonstrated a significant risk to the individual, health care worker and community. Focus Project activities between 2002 and 2003 included the Ministry of Health endorsing a National Policy on Immunization Safety and Safe Waste Management for all health facilities. By 2003 no injections were observed to be administered through a reused syringe (a 4% decrease from baseline). There was a 39% reduction in needle stick injuries to health care workers complimented by a decrease in syringe recapping and fewer over flowing safety boxes. A reduced risk to the community as a whole was also documented. These results have been sustained through to a reassessment carried out in 2008 that used the same monitoring and evaluation indicators as before.

BURKINA FASO (2005)

http://www.biomedcentral.com/content/pdf/1471-2458-5-136.pdf

In 1995, a new medicine policy was implemented in Burkina Faso and this retrospective study demonstrates its subsequent success between 1995 and 2000 in improving safe injection practices through increased access to injection devices. In total, 52 health care facilities were assessed of which 50 were equipped with a pharmaceutical depot selling syringes and needles. 48 had single-use 5ml syringes available and all patients were purchasing syringes and needles from the depot. This study confirms that the implementation of pharmaceutical depots close to public health care facilities increased access to essential medicines and supplies thus promoting safer injection practices.
BURKINA FASO (2004)
http://intqhc.oxfordjournals.org/content/16/4/303.long

Burkina Faso has been the site of two previous injection safety studies conducted in 1989 and 1995-1996. This study from June 2000 assessed 80 primary health facilities using a new standardized tool designed by the World Health Organization to look at injection practices. Results showed that in 50 facilities a new, single-use syringe and needle were used when administering injections. All 80 facilities had sufficient stock in the community to provide these new types of injections. The results concluded that between 1995 and 2000, there was an increase in the use of sterile injection equipment in Burkina Faso. While this increase is a step forward since 1995 towards improved injection safety, major challenges still remain as shown by other results in this study. Problems concerning needle recapping and sharps waste disposal (used needles were discarded in open containers in 66 facilities and could be seen in the surroundings of 46 facilities) still need to be addressed.

ETHIOPIA (2009)

In 2008, four districts in Ethiopia were evaluated for injection safety and health care waste management through the Making Medical Injections Safer (MMIS) project. The aim was to assess changes in practices from a baseline study conducted four years earlier. An improvement was visible in the availability and quantity of injection equipment such as syringes, needles and safety boxes. The impact of this was reflected in results showing a statistically significant improvement with regards to needlestick injury reporting, immediate disposal of needles and general hygiene. Since the baseline survey, injection safety and waste management training more than doubled for injection providers and more than tripled for waste handlers hence increasing the awareness level of injection safety practices. Compared to the baseline, there was a small increase in the number of injection providers who took at least one dose of hepatitis B vaccine however major improvements are still required in this area as well as with the availability of reference documents and management tools.
SIGN: Summaries of Injection Safety Country Success Stories 2011

GAMBIA (2004)

This cross-sectional study was designed to assess injection safety practices developed by the Expanded Program on Immunization (EPI) team under an Appui Régional à l’Indépendance Vaccinale en Afrique (ARIVA) consultant in the capital city of Banjul. Questionnaires were distributed to cover the three main levels of the health system; Central, Divisional and Public. Results showed that the ‘One Needle – One Syringe’ injection safety policy was applied in all health divisions and in 88.6% of Public Health Facilities. A five-year (2002-2009) strategic injection safety plan had already been constructed by the EPI team and showed that AD syringes were available and used in all Health Divisions and in 90% of Public Health Facilities.

The majority of health workers recognized the importance of safety boxes and a sufficient supply could be found at the Central Level. Since a previous survey in 2001, there has been a 20% increase in the availability of complete kits for immunization safety in Public Health Facilities. Poor results recognized challenges such as in the reutilization of syringes and needles in the community and health care system that still need to be addressed.

KENYA (2007)

PEPFAR, the U.S. President's Emergency Plan for AIDS Relief, has provided support at the Embu Provincial Hospital in Central Kenya to prevent medical transmission of HIV. It focuses on reducing the number of unnecessary injections through injection safety training of over 14000 health workers to date. Positive results have shown a decrease in the number of curative injections by nearly 95% between training in 2006 and assessment in 2007.

MADAGASCAR (2003)

Over a five week period in 2000, vaccination practices at fifteen Madagascan clinics were assessed to evaluate the safety and coverage benefits of auto-disable (AD) syringes. These clinics were randomized to use only an AD syringe, mixed (AD syringes only for non-routine immunization days) or only sterilizable syringes as the control group. Coverage rates were augmented allowing significant increase in the percentage of vaccinations administered on a non-routine immunization day and the number of sterilization sessions was reduced. Both these factors contributed to improved injection safety. AD syringes were more expensive to supply however it was calculated that the national immunization budget would increase by only 2% if AD syringes were introduced for all vaccinations.

MALAWI (2010)

A peer-group intervention strategy was implemented in an attempt to improve universal precaution knowledge and teaching skills of health workers in two rural districts of Malawi (one control and one intervention district). Results demonstrated that the intervention district had more HIV teaching and universal practice knowledge complemented by a reduction in needlestick injuries and improved general hygiene 30months post intervention. This shows that improved training can bring about safer injection practices through behaviour change in rural health workers.
MALAWI (2009)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B7MDD-4WNB0VK-C-1&_cdi=23228&_user=8658645&_pii=S1055329009000685&_origin=&_coverDate=08%2F31%2F2009&_sk=999799995&view=c&wchp=dGLzVzb-zSkS&md5=10eff174caacc94c075ca4b183b15d87&ie=/sdarticle.pdf
At one of the four regional referral hospitals in Malawi, the Mzake ndi Mzake (Friend to Friend, in Chichewa) peer-group intervention was implemented to improve universal precaution (UP) knowledge and practices. Although UP knowledge was initially high among health workers, 77% at baseline, there was an increase to 79% post intervention. Clinical and technical health workers improved their sharps knowledge by almost 10% and nonclinical support workers by nearly 14% following peer-group intervention. This report demonstrates how urban health worker training has the potential to prevent needlestick injury through increased sharps knowledge.

MOZAMBIQUE (2009)
This injection safety and health care waste management report compares the results of the baseline and follow up surveys that took place in two provinces in Mozambique; Gaza and Nampula, during November 2005 and November 2008 respectively. Results showed a significant improvement between baseline and follow up in the availability of reference documents and guidelines for injection safety, safety box distribution and their tracking mechanisms as well as injection safety training. A reduction in recapping of syringes and needle stick injuries was also noted.

NAMIBIA (2009)
The Namibian Ministry of Health and Social Services in collaboration with the President’s Emergency Plan for AIDS Relief (PEPFAR) and University Research Co., LLC (URC) aimed to improve injection safety and medical waste disposal in a nationwide program; training over 7,000 public and private health care workers. Following a baseline survey in 2004, improvements were found in safe sharps container distribution, rationale use of injectable medication, post exposure prophylaxis (PEP) availability and Hepatitis B screening and vaccination.
SIGN: Summaries of Injection Safety Country Success Stories

NIGERIA (2009)

The Nigerian Ministry of Health and USAID’s Making Medical Injections Safer (MMIS) project worked together to try and strengthen injection safety practices by reducing unnecessary injections and replacing them with non-injectable medications where appropriate. The baseline survey was conducted between August 2004 and January 2005 then, following health care worker training intervention, results were recorded from August 2007 to January 2008. Post intervention results demonstrated that a patient at baseline was 1.65 times more likely to have been prescribed an unnecessary injection than at follow up even though there was an increase in the availability of injectable medications. This therefore suggests that the reduction of unnecessary injections was due to behaviour change in health workers.

NIGERIA (2009)
MMIS for the Office of the Global AIDS Coordinator (OGAC) and USAID

The Federal Ministry of Health and Making Medical Injections Safer organized an evaluation of injection safety and health care waste management at intervention sites. A comparison of baseline data collected in 2005 and follow up data collect in 2008 showed significant improvements in safety box availability and use, good practices of sharps disposal, use of sterile syringes, needle stick injury reduction and Hepatitis B vaccine administration for injection providers. Injection safety and health care waste management was strengthened at the intervention sites in Nigeria for this project.

NIGERIA (2006)

Health worker education in the form of training on basic injection safety practices has been proven to be an effective intervention to ensure safer injection practices in health facilities in Nigeria. Workers in the intervention group had significantly improved injection safety knowledge such as the understanding what a safe injection is, safety policies and the safe disposal of sharps waste. This acquired knowledge was also translated into improved safety practices.

SENEGAL (2005) (French)
http://www2.sante.gouv.sn/IMG/pdf/enquetesecuriteinjections.pdf

This report assesses changes in injection safety and medical waste management in Senegal in 2005 in comparison to a baseline survey conducted in 2002. Strong improvements were recorded in many previous problematic areas including a decrease in the use of sterilizable equipment, needle recapping and subsequent needlestick injuries. Over the 3 year period, access to guidelines on safe injections and waste management increased by approximately 60% and access to safety boxes increased by almost 90%. Evidence clearly suggests an improvement to health care worker and patient injection safety however further attention is required to ensure safe final sharps disposal for community safety.
TOGO (2005)

The Expanded Program on Immunization Program in 2005 documented success in injection safety during mass immunization campaigns. It was documented that injection safety became widespread with 100% use of auto-disable syringes at immunizing centres. 84% of all safety boxes were destroyed via incineration which was a 12% improvement over the previous year. Support funds for injection safety were efficiently used in supporting various immunization strategies.

UGANDA (2009)

Making Medical Injections Safer aids the Ministry of Health in implementing safer injection interventions in four districts of Uganda. This study was constructed to measure the effectiveness of the training, communication strategies and changes in policies aimed to reduce unnecessary injections. Pre and post intervention prescription record data was obtained and results showed that, with health worker training and behaviour change campaigns, a significant reduction in unnecessary injections was possible. In the intervention districts, a decrease of 5.9% in the amount of injectable medications was recorded between baseline and follow up surveys.

UGANDA (2007)

With support from the U.S. President’s Emergency Plan for AIDS Relief Making Medical Injections Safer, Nurse Owomugisha attended a four-day training course in 2004 on injection safety provided by USAID. Education on the efficacy of oral treatment in place of injectable treatment resulted in a fall in injectable medication prescriptions to only 2% of all prescriptions in Kashongi; a small health unit in south west Uganda.
ZAMBIA (2009)

Previous poor assessments on infection prevention and injection safety practices in Zambia contributed to the Ministry of Health launching the National Infection Prevention Guidelines and the formation of the National Infection Prevention Working Group (NIPWG) in 2003. In 2004 following these developments, the Zambia Medical Injection Safety Project (MISP) was established and implemented by Chemonics International Inc. in collaboration with Jhpiego and The Manoff Group. An evaluation of the project in 2008 demonstrated that the project had managed to achieve many of its aims including significant improvements in injection safety practices. A reduction was seen in needle recapping and the presence of sharps in immediate surroundings. Managers were trained on the importance of providing post-exposure prophylaxis (PEP) which led to a moderate increase in availability of 5.3% in health care facilities. The use of community theaters, which are culturally acceptable and inexpensive, provided a way of reaching communities and influencing behaviour change. As a result of drama performances, a notable decrease in the demand for injections by local communities has been seen.

p24: Wallance Tembo (playing a ‘doctor’) of Omodzi Theater emphasizing a point about safe injections
AMRO

(WHO Regional Office for Americas)
AMRO (WHO Regional office for Americas)

ECUADOR (2010)

The Healthy Hospital Project is aimed to strengthen Ecuador’s capacity to promote healthier and safer hospitals by reducing occupational transmission of infectious diseases. A training workshop for health workers led to improved overall knowledge with a significant change regarding proper procedures concerning needle recapping. Hospital awareness campaigns on needlestick injury prevention lead to an increase in general safety of all healthcare workers. A survey of knowledge change following training in 2007-2008 demonstrated a knowledge increase of 47.4% in the prevention of needlestick injuries. It is believed that the Healthy Hospital Project managed to achieve all of its goals.

GUYANA (2010)
www.ijic.info/article/download/5037/4208

Diabetic insulin users account for a large majority of injection equipment consumers whose practices can impact wider community safety. This paper presents a pilot study constructed in 2008 to test low cost, practical options for improving insulin syringe use and disposal safety in Guyana. Results showed that with training, nurses and pharmacists were able to counsel clients successfully. The provision of a full supply of insulin needles resulted in a decline in needle re-use from 87% to 8%. A single needle for each injection, disposing of used syringes into containers and disposal of full containers made patients feel safer. All disposal containers provided worked effectively with no punctures or leakages but in the Guyana context, tablet or client sourced containers are the most sustainable due to no additional costs and increased availability.

GUYANA (2007)

The PEPFAR funded Guyana Safer Injection Project (GSIP) was created to assist the Ministry of Health in finding effective, safe and affordable options for the final disposal of needles. In this study, GSIP piloted a needle remover device and sharps barrels at health posts, centers and small hospitals in three regions. Assessment showed that health workers and waste handlers were generally very accepting of the device and sharps barrels; 100% reported that they felt it would reduce their risk of needle stick injury, that they were easy to use and most reporting that the device performance was ‘very good’ or ‘excellent’. No needle stick injuries were reported at any of the 34 pilot sites for 12 months.
SIGN: Summaries of Injection Safety Country Success Stories

PERU (2008)

In 2006, UNICEF and the Peruvian Ministry of Health, with support from PATH, carried out an evaluation to assess perceptions of acceptability and safety of automatic retractable syringes in a nationwide measles-rubella immunization campaign and their effect on waste disposal. Questionnaires, focus groups and interviews were used to collect evidence that confirmed that safety significantly improves with the use of retractable syringes. 93% of vaccinators said they did not get a needlestick injury during the campaign and 98% claimed that the disposal of retractable syringes was much simpler compared to the use of standard disposables.

UNITED STATES OF AMERICA (2010)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6W9M-51H0C6Y-G-1&_cdi=6686&_user=8658645&_pii=S0196655310007960&_origin=&_coverDate=12%2F31%2F2010&_sk=999619989&view=c&wchp=dGLzVzb-zSkWl&md5=035d42e5d93a6a2eac7110372a29f18&ie=/sdarticle.pdf

It is believed that greater than 90% of sharps injuries are related to sharps container design. This paper assesses the impact of a sharps container with an enhanced engineering design on sharps injury categories in 14 Ascension Health hospitals in a before/after intervention study from 2006 to 2008. The device was associated with significant reductions in after-procedure (230%), disposal-related (257%) and container-associated (281%) sharps injuries in the intervention group. Hospitals using the device had significantly fewer sharps injuries than the control hospitals.

UNITED STATES OF AMERICA (2008)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B984P-4V11MCX-1-9&_cdi=59076&_user=8658645&_pii=S1876034108000294&_origin=&_coverDate=12%2F31%2F2008&_sk=999989997&view=c&wchp=dGLbVzW-zSkWl&md5=b361548f915f0a311ca48be797d7d47e&ie=/sdarticle.pdf

This paper examines how the United States federal legislation requiring safety-engineered devices along with other protective measures has notable strengths when trying to reduce healthcare worker risk of occupational exposure to bloodborne pathogens. The Exposure Prevention Information Network (EPINet) is a sharps injury surveillance program of a large collective of U.S. hospitals. Results showed an overall decline in injury rates for hollow-bore needles by 34%, with a 51% decline for nurses alone. The United States example provides evidence for how safety-engineered devices can reduce sharps injuries of health workers through the support of national-level regulation that is actively enforced.
SIGN: Summaries of Injection Safety Country Success Stories

UNITED STATES OF AMERICA (2004)

The Memorial Sloan-Kettering Cancer Center is a 427-bed, tertiary-care cancer hospital in New York City. This paper presents the before and after intervention results comparing 3 year (1998-2000) pre-intervention data with 1 year post-intervention data (2001-2002). In this 2001 trial, a ‘safer-needle system’ of safety-engineered devices was implemented. The introduction of safety engineered devices led to a reduction in the mean annual incidence of percutaneous injuries from 34.08 per 1000 full-time equivalent employees pre-intervention to 14.25 post-intervention. Nurses experienced the greatest decrease in average monthly number of injuries. In sum, the use of safety engineered devices in this hospital setting reduced percutaneous injuries across occupations and activities.

UNITED STATES OF AMERICA (2004)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6W9M-4CYPGH7-G-5&_cdi=6686&_user=8658645&_pii=S0196655304003566&_origin=&_coverDate=08/31/2004&_sk=999679994&view=c&wchp=dGLbVzSkzS&md5=33560e36938bb1c3c076cb991be43399&ie=/sdarticle.pdf

The University of Connecticut Health Center Employee Health Service collected and used NaSH data (National Surveillance System for Hospital Health Care Workers) to improve healthcare worker exposure to blood and body fluid surveillance and to target high risk groups with specific interventions. Interventions included activities such as increased education, purchasing changes and greater administrative involvement. Between the academic years of 1997 and 2002, there was a decline in the number of percutaneous injuries for medical/dental students (from 7.9% in 2000 to 2001 to 2.6% in 2001-2002) and nurses (from 9.2% in 1997 to 1998 to 2.7% in 2001 to 2002). This study demonstrates the importance of surveillance and periodic review of interventions in order to reduce blood and body fluid exposures especially in high-risk occupational groups.

UNITED STATES OF AMERICA (2003)
http://www.jstor.org/stable/10.1086/502174

A hospital study in New York using safety resheathable winged (butterfly) steel needles as an intervention to reduce percutaneous injuries of health care workers who previously performed intravascular-access procedures with winged steel needles. The injury rate associated with winged steel needles following implementation of the safety device declined from 13.41 to 6.41 per 100,000 with the most significant reduction occurring with injuries during or after disposal. 63% of health workers preferred the safety winged steel needle over the standard device.
UNited States Of America (2003)

The Needlestick Safety and Prevention Act of 2000 became fully enforceable in July 2001 in the United States of America. Making the use of safety devices mandatory had a substantial effect on improved injection safety procedures that lead to a reduction in needlestick injuries. A fundamental result discovered through the comparison of data from 1993 to 2001 shows nurse percutaneous injury (PI) rates decreased from 19.5 PIs per 100 occupied beds in 1993 to just 9.6 PIs per 100 occupied beds in 2001, a dramatic decrease of 51%.

UNited States Of America
One and Only Campaign
http://www.oneandonlycampaign.org/
http://www.cdc.gov/injectionsafety/1anOnly.html
http://cid.oxfordjournals.org/content/51/3/267.full.pdf+html
http://health.nv.gov/PDFs/Hepatitis/hepatitisplanevaluation.pdf

Since 1999, more than 125,000 patients living in the United States of America have been notified about potential exposure to Hepatitis B, Hepatitis C and HIV because of unsafe injection practices such as syringe reuse. An outbreak of Hepatitis C in Nevada in 2008 reinforced the call for action to improve injection safety in a healthcare centre setting. The One & Only Campaign was created by the Centers for Disease Control (CDC) and the Safe Injection Practices Coalition (SIPC) with the aim of eradicating disease outbreaks resulting from unsafe injection practices.
EMRO

(WHO Regional Office for the Eastern Mediterranean)
**EMRO (WHO Regional Office for the Eastern Mediterranean)**

**IRAN** (2011)
http://www.biomedcentral.com/1753-6561/5/S6/P221

This study was carried out before and after intervention between 2003 and 2008 among healthcare workers in 31 hospitals of Isfahan Province. Most of the intervention was instructional with some sections were by using appropriate equipment. Evaluation showed that there was a reduction in the number of needlestick injuries to just 7%, an 11.3% reduction in injuries resulting from recapping and a reduction of 1.25% in the average number of injuries per each staff in the first year.

**PAKISTAN** (2009)
http://www.biomedcentral.com/1471-2334/9/78

A quality improvement project was created in 2005 at the Aga Khan University hospital to reduce sharps injuries. An intervention of healthcare worker education was implemented and surveillance data from 2002 to 2007 was analyzed. A significant reduction in needlestick injuries was observed especially in 2006 and 2007. This study therefore confirms the fact that regular educational sessions can improve awareness of injection safety among health workers.

**PAKISTAN** (2004)
http://hope-ngo.com/LinkClick.aspx?fileticket=cOH0W81eOvO%3D&tabid=70&mid=511

This pilot intervention in two urban areas of Karachi, Pakistan was designed to reduce the overuse and strengthen injection practices in the private sector. Twenty Health Care Providers (HCPs) were included both from the intervention and control sites. Intervention took the form of interactive group discussions. Comparison to baseline data demonstrated that 51% of patients in the intervention group had received an injection compared to 84% in the control group. The intervention group also benefited from an increase in injections administered with a new syringe and increased use in needle cutters for safer sharp waste disposal.
SYRIAN ARAB REPUBLIC (2007)

In lieu of an injection safety assessment in 2001, the Ministry of Health in conjunction with the WHO, introduced a ‘Focus Project’ designed to ensure immunization safety throughout the Syrian Arab Republic. The first phase of the project began in 2002 and a follow-up survey was implemented in 2004. The survey was designed in order to assess the impact of improved supply of injection safety equipment, improved national guidelines on injection safety and waste management, increased access to training of healthcare workers and a behaviour change communication campaign targeting the general public. The impact on injection practices were significant two years after the inauguration of the project. The 2004 follow-up survey recorded that 90% of healthcare workers had received injection safety training which subsequently lead to all observed injection being administered safely (although some problems in preparation and reconstitution remained). There was a notable reduction in risk not only to healthcare workers but also to the community through improved sharps waste management. Only 14% of staff reported needlestick injuries compared to 61% in 2001 and sharps were found on the outside of only 13% of health facilities in 2004. A vast improvement of injection safety in Syria was possible in a well-structured immunization programme however attempts to transfer this success into other curative healthcare settings still pose a challenge.
EURO

(WHO Regional Office for Europe)
EURO (WHO Regional Office for Europe)

FRANCE (2007)

This study was designed to evaluate the effectiveness and importance of safety-engineered devices (SEDs) in reducing needlestick injuries (NSIs) in a French hospital network of 102 medical units from 32 hospitals. Data from a survey in 2000 showed that SEDs used during phlebotomy procedures led to a 74% lower risk of NSIs. Between 1990 and 2000, a clear correlation could be seen where NSI rates for each procedure decreased when use of SEDs increased.

NETHERLANDS (2011)

This paper presents a three-armed cluster randomized controlled trial of 23 hospital wards in the Academic Medical Center, Netherlands. Healthcare workers at risk of needlestick injuries (NSIs) were randomly assigned to 1 of the 2 intervention groups or control group. The interventions consisted of either a needle safety device and a workshop (NW) or just a workshop (W). Over the 12 month follow-up period, the reductions in self-reported NSIs in the NW and W groups were 64% and 21%, respectively however the officially registered NSIs showed no statistical difference between the groups. In summation, the combined intervention of a needle safety device coupled with an interactive workshop resulted in the highest reduction in self-reported NSIs compared to a workshop alone or no intervention.

p1181: Fig. 1b. Disposal of injection needle with closed safety device
SPAIN (2007)

Since 2002, a 350-bed general hospital in Alicante, Spain, has had an on-going educational program for the prevention of percutaneous injuries. In 2005, a new program was implemented for the use of engineered devices to prevent percutaneous injuries by providing nurses with training sessions on occupationally acquired bloodborne infections as well as ‘hands on’ training with the devices. Pre-intervention (October 2004-March 2005) results were compared with the intervention period (October 2005- March 2006). There was a significant reduction of 93% in the relative risk of percutaneous injuries in areas where safety devices were used. The greatest decrease was in injuries occurring in hospital wards.

UKRAINE (2005)

Ukraine introduced auto-disable (AD) syringes in 2003 following an injection safety assessment in 2002. A pilot project was then designed to find a safe, practical and cost-effective process for disposing AD syringes without burning. Interventions tested included using a needle cutter, neutralisation by autoclaving, containment with safety container and autoclaving bag, an alternative transport method and disposal through shredding and recycling. Feedback from health staff comprised of an overall feeling of increased safety when disposing of injection equipment and that autoclaving was feasible and a well-accepted procedure. The use of safety containers for needles and autoclaving bags for syringes also improved safety for healthcare workers. In the new intervention system, risk to health worker was dramatically decreased with the average number of needlestick injuries per facility subsequently dropped to 0 compared to 48 in the old system.

UNITED KINGDOM (2006)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6WJP-4KBDW8X-4-7&_cdo=6884&user=865645&_pii=S0195670106002192&origin=&_coverDate=09%2F30%2F2006&_sk=999359998&view=c&wchp=dGLzVlb-zSkWz&md5=ba032101697a0a5d3d8e08578f6bc6f&ie=UTF-8

A four-year prospective study at the University Hospital Birmingham National Health Service Foundation Trust was carried out to assess the impact of the introduction of a range of safety hypodermic needle devices on the number of reported needlestick injuries (NSIs). Data from four clinical areas (two surgical wards, one medical ward and one outpatient department) on the number of reported NSIs began in 2001. Following implementation of an enhanced sharps education programme, the number of NSIs in 2002 decreased by 18% compared to 2001. The introduction of three safety needle devices with concomitant training results in a significant reduction in the number of reported NSIs by 70%. Acceptability and satisfaction of the devices by healthcare workers was high. These results confirm that if safety needles devices are introduced with appropriate training, a significant reduction in the number of NSIs may follow.
UNITED KINGDOM (2001)
http://www.nature.com/tdj/journal/v190/n2/pdf/4800891a.pdf

Sharps injuries in dental practices are most likely to occur during the removal and disposal of needles from a non-disposable syringe. Disposable safety syringes were therefore introduced into a dental school coupled with staff and student training and compared to a control unit using non-disposable syringes over a two year period. Results showed a decrease in the average of avoidable needlestick injuries from 11.8 to 0 per 1,000,000 hours worked per year in comparison to the control unit where needlestick injury frequency was only reduced from 26 to 20 injuries per 1,000,000 hours worked. This example demonstrates how disposable syringes and education play vital roles in improving safety in the dental workplace.
SEARO

(WHO Regional Office for South East Asia)
SIGN: Summaries of Injection Safety Country Success Stories

**SEARO (WHO Regional Office for South East Asia)**

**INDIA (2009)**
http://www.medind.nic.in/ibv/t10/i5/ibvt10i5p409.pdf

In 2007, this randomized controlled trial in rural public health care facilities in West Bengal, India was designed to determine whether ‘interactional group discussions’ (IGDs) could reduce the number of injectable prescriptions given by physicians. 36 medical officers were involved in the intervention and 36 in the control group. Results confirmed that IGDs were a suitable intervention to reduce prescription of injections; in the control group 21% of prescriptions included at least one injection before the intervention compared to 16% post-intervention.

**INDIA (2007)**

The collaboration between the Government of Andhra Pradesh and PATH’s Children’s Vaccine Program enabled a Partnership Project to be constructed that worked on strengthening immunization systems throughout the state. Injection safety was a top priority and was targeted through the introduction and scale up of a practical sharps waste management system. Pilot study results were positive, with a reduction in the injectable medications list from 181 to 27 drugs. Five-liter safety boxes with auto-disable syringes were introduced in six districts however all 23 districts had access to one-liter safety boxes. The pilot study success led to a scale up of the project. The sharps waste management system was expanded to all 1,400 Primary Health Centers and 12,500 health sub-centers in all 23 districts of Andhra Pradesh. Needle remover devices for the safe disposal of used syringes became routine practice (2004-2006). The Niloufer Teaching Hospital in Hyderabad was established as a model injection center (MIC) for training staff on safe injection best practices. In 2005 alone, over 2000 demonstration sessions were provided and between 2004 and 2005, 23,000 injections were administered without any reports of needlestick injuries. MICs were then established in a further 25 medical college hospitals.
INDIA (2004)
http://www.path.org/vaccineresources/files/CVP_AP.pdf

In India, reuse of syringes and needles has been a common cause for concern. In order to ensure injection safety, auto-disable syringes are now used for all nine million immunization injections that are administered annually throughout the state of Andhra Pradesh. This transition has led to rapid results such as auxiliary nurse midwives reporting almost complete disappearance of abscesses following immunization injections. Such results have brought awareness to the federal government who are considering a scale up and adoption of AD syringes for nationwide immunizations.

INDONESIA (2007)

UNICEF contracted PATH to conduct a field evaluation of three WHO prequalified RPF (reuse prevention features) syringes used during a measles campaign in Lombok, Indonesia, in August 2007. This study was in preparation for the 2008 global introduction of RPF syringes for all UNICEF immunization programs. All participants felt the training provided was necessary for understanding how the new syringes worked and 90% of users felt that the RPF syringes were safer as they prevented the reuse of equipment. 100% of those using the retractable syringe felt it was safer than the standard syringe as it prevented needlestick injuries as well as vial contamination. It also allowed safer waste disposal since the needle was no longer exposed.

INDONESIA (2005)
PATH (2005) Medical Waste Management for Primary Health Centers in Indonesia

Three districts in one province on the main Indonesian island of Java were selected for an 18 month project. The project’s aim was to model effective options for medical waste management for health centers. Eight steps were used to create waste management solutions suitable to different local contexts. Results showed a decrease in the recapping of syringes, an increase in safety box distribution and segregation of waste as well as a reduction in syringes found scattered around health facilities. By the end of the project, 75-85% of rural health centers were transporting waste to incinerators, waste collection was almost routine in urban centers.
WPRO

(WHO Regional Office for the Western Pacific)
WPRO (Regional Office for the Western Pacific)

AUSTRALIA (2008)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6W9M-4S4D8DP-7-1&_cdi=6686&_user=8658645&_pii=S0196655307007754&_origin=&_coverDate=04%2F30%2F2008&_sk=999639996&view=c&wchp=dGLbVlW-zSkWz&md5=e6774d03868af1c38cfdde73e000a0f96e&ie=UTF8
Hollow-bore needles pose a substantial risk of needlestick injury (NSI). This paper presents an evaluation study on the impact on NSI rates following the replacement of hollow-bore needles with safety engineered devices (SEDs) in an Australian 800-bed university hospital. Examples of SEDs included retractable syringes, needle-free intravenous (IV) systems and safety winged butterfly needs. After the introduction of SEDs, NSIs were monitored for 2 years (2005-2006) and compared to pre-intervention data from 2000-2004. This study demonstrates that the introduction of SEDs into a teaching hospital can significantly reduce NSIs; high risk injuries were reduced by 57% through the use of retractable syringes.

CHINA (2010)
Sakamoto, K. (2010) Expanded Program on Immunization Strengthening Project China. Department of Disease Control, Ministry of Health (Supervising agency) and Chinese Center for Disease Control and Prevention (Executing Agency)
http://www.jica.go.jp/english/operations/evaluation/tech_and_grant/project/ex_post/pdf/china09_se04.pdf
The overall goal of the Expanded Program on Immunization (EPI) Strengthening Project in China was to ensure safe and effective services in all covered provinces and this is believed to have been achieved. Auto-disable syringes are being used 100% of the time thus completely observing the rule of ‘One Needle, One Syringe, Only One Time’. It is therefore assumed that almost 100% of EPI staff are able to administer safe injections in all provinces according to the terminal evaluation report.

CHINA (2010)
Unsafe sterilization practices of glass syringes, unsafe sharps disposal and breaks in infection control practices were reported in a 2001 assessment in Fumeng and Wulong Counties (Liaoning province, North-eastern China and Chongqing municipality, Western China). A following study in 2009 demonstrated a significant improvement in injection safety practices most notably in the use of disposable syringes. All facilities in both counties used new, disposable syringes in 2009 compared to just 34% in 2001. Other important results showed that 59% and 74% of providers in Fumeng and Wulong collected used sharps safely compared to 33% and 36% at baseline. An improvement was seen in the reduction of injection devices discarded directly in to regular trash. The annual number of injections per person increased slightly in Fumeng however remained stable in Wulong.
SIGN: Summaries of Injection Safety Country Success Stories 2011

CHINA (2002)

Prior to this study it was believed that the principles of universal precautions (UP) were not widely publicized in Chinese hospitals hence placing many nurses at risk from occupational exposure to bloodborne pathogens (BBP). In the intervention group, a structured BBP prevention training programme was implemented among student nurses in Changsha, People’s Republic of China. Results were recorded during a 4-month follow up period to record any changes in knowledge, self-reported UP behaviours, observed adherence to UP and needlestick injuries. The intervention group scored significantly higher than the standard education control group on knowledge, behaviour and experienced fewer needlestick injuries.

MONGOLIA (2006)
http://moh.mn/moh%20db/HealthReports.nsf/32fe9f3e7452a6f3c8256d1b0013e24e/c6599c1d6e3fce3ac825724a002f2140/$FILE/injection_safety_report_eng.pdf

The interventions implemented following the 2001 rapid assessment of injection practices in Mongolia needed to be reassessed in 2006 in order to observe achievements in injection safety that occurred during this 5 year period. Results suggest that there has been progress in safe injection practices. Almost every injection (99.3%) was administered using new, disinfected and disposable syringes with 86.2% of used syringes and needles disposed of in safety boxes. Stock of immunization syringes and needles and the provision of safety boxes were considered adequate. 91.1% of health facilities also had suitable final waste disposal where used syringes and needles were burned at the facility or transported to a general burning drum.

MONGOLIA (2003)
http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6W9M-4BK25HM-D-7&_cdi=6686&_user=8658645&_pii=S0196655303007569&_origin=&_coverDate=02%2F29%2F2004&_sk=999679998&view=c&wchp=dGLzVzb-bSkWiRmd9-zSkWb&md5=8781feb02bc628b33afff1a8bf0399bd&ie=/sdarticle.pdf

In 2001, the Ministry of Health of Mongolia collected information on injection practices using the Injection Practices: Rapid Assessment and Response Guide developed by the World Health Organization. Anecdotal reports prior to 1990 suggest that most injections were given with injection devices reused without sterilization however, in 2001, new, single-use injection devices were used in all 20 health facilities visited. Sharps waste was also methodologically destroyed after use in each facility. This study emphasizes the need for a multidisciplinary initiative in order to achieve safe and appropriate injection use in Mongolia.
VIETNAM (2007)

PATH and the Ministry of Health Vietnam implemented a six-month project in Huong Khe District, Ha Tinh Province, Vietnam, to demonstrate the acceptability, performance and impact on waste disposal of a manual needle remover introduced at commune health centers (CHCs). A significant improvement in medical waste disposal practices was observed in intervention groups that used needle removers, needle pits and safety boxes which ultimately resulted in a safer CHC environment. As well as an improvement in medical waste disposal, safe injection practices after the study were also greatly improved as seen by a decline in needlestick injuries, in contaminated syringes/needles left on tables and in the selling of used syringes/needles.


In 2001, the first batch of vaccines bundled together with AD syringes and safety box equipment made it into the Expanded Programme on Immunization (EPI). With support from UNICEF, GAVI and the WHO Western Pacific Regional Office, the introduction of safe injection equipment into routine immunization was phased-in throughout the countries of the Mekong; Cambodia, the Lao People’s Democratic Republic and Vietnam. Waste disposal and incineration were provided and funded for by donors including the Japanese Government and the Australian Agency for International Development. Political will, technical support and funding aided Cambodia’s push for safer injections such as through the development of an inter-agency committee. AD syringes, safety boxes, safe incineration and waste disposal are now widespread in Cambodian routine immunization programmes. Similarly in the Lao People’s Democratic Republic, AD syringes, safety boxes and auto-combustion incinerators have been phased into its entire immunization programme. The WHO collaborated with these programmes to design a backpack that can hold necessary injection safety equipment for outreach immunization activities in addition to EPI vehicles delivering supplies to act as collectors of full safety boxes. Vietnam opted for a different strategy where it applied to GAVI in 2002 for funding to purchase locally manufactured AD syringes and safety boxes, it has been a success. Both the Ministry of Health and SIGN are working together to target nursing associations and raise injection safety awareness through seminars and publications.
GLOBAL
GLOBAL

58 GAVI ALLIANCE INJECTION SAFETY SUPPORTED COUNTRIES (2008)


In 2008, GAVI contracted JSI Research and Training Institute, Inc. (JSI) to evaluate the Injection Safety support (INS) window by focussing on the experience of 58 countries that were awarded INS during the program’s first three years. Results showed that 44 of the 46 commodity-recipient countries were able to replace and sustain the use of auto-disable (AD) syringes after GAVI INS support ended. The use of AD syringes is higher in GAVI INS supported countries than in non-GAVI lower-middle-income countries. According to 80% of program managers, GAVI INS is believed to have had some influence on injection safety practices in health services beyond immunization and 17% of managers noted that AD syringes and safety boxes had been introduced in to other curative services. New injection safety technologies were well accepted by local health workers as shown by interviews with managers in Box 4. Interviews also demonstrated that many countries are disposing of their used syringes and safety boxes using incinerators where available. GAVI INS also had a powerful influence over the development of injection safety policies in the health sector.