



Rational and Safe use of Injections Worldwide

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Sponsored by WHO First Global Patient Safety Challenge - Clean Care is Safer Care

Ensuring rational and safe use of injections worldwide: Achievements and way forward

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Outline

- Historical perspective
- Facts and figures on injections worldwide
- Safe Injection Global Network (SIGN)
- WHO/SIGN strategies on Injection Safety
 - At global level
 - At country level
- Achievements so far
- Are we done with injection safety ?

SIGN Roots I

- Syringes first introduced in 1848
- Blood-borne pathogens recognized >100 years later:
 - 1940's (hepatitis B virus)
 - 1980's (HIV, hepatitis C virus)
- Major solutions (and their shortcomings):
 - Steam sterilization (need time + fuel => poor compliance)
 - Disposable syringes (continuous supply + waste management) => poor solution for resource-deprived settings

SIGN Roots II: 1980's -1990's

- WHO **Essential Drug**: anthropology of injections
- **Immunizations** (J Lloyd, M Zaffran, A Battersby, R Felden, R Steinglass, R Fields, S Landry, + others)
 - 1986 WHO/UNICEF policy on single sterile syringe + needle
 - 1986 WHO RFP on AD syringes to prevent reuse
 - 1994: ~30% unsafe (=> 5% 1997) Yamoussoukro Declaration
 - 1997: Adam Kane paper => 1998: SAGE
 - 1997: WHO/UNICEF policy on "bundling" for mass campaigns
 - 1998: meetings @ BASICS x 2
 - "Vital to Health" briefing doc for policy makers
 - Need for WHO based coordinator

Transmission of hepatitis B, hepatitis C and human immunodeficiency viruses through unsafe injections in the developing world: model-based regional estimates

A. Kane,¹ J. Lloyd,² M. Zaffran,³ L. Simonsen,⁴ & M. Kane⁵

Thousands of millions of injections are delivered every year in developing countries, many of them unsafe, and the transmission of certain bloodborne pathogens via this route is thought to be a major public health problem. In this article we report global and regional estimates of the number of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infections that may occur from unsafe injections in the developing world. The estimates were determined using quantitative data on unsafe injection practices, transmission efficiency and disease burden of HBV, HCV and HIV and the prevalence of injection use obtained from a review of the literature.

Bull WHO 1999; 77:801-6

Injection safety in the media



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SIGN Inception: December 1999

- **Name:** Safe Injection (Global) Network (SIN=>SIGN)
- **WHO "home":** Blood Safety and Clinical Technology (BCT) Team
 - Migrate outside of EPI, but still within Cluster (No nosocomial unit)
 - Support of Communicable Disease Cluster
- **Format:** Secretariat + National Chapters + SIGN List serve
- **Advocacy:**
 - Bull WHO special issue (ID authors, topics, Adam Kane paper)
 - (2000 WHA Resolution: eliminate largest iatrogenic problem of 20th C.)
- **New joint WHO-UNICEF joint policy on "bundling strategy"**
 - AD = Auto-Disable <= Auto-Destruct
 - mass campaigns => all routine immunizations
- **Alternative injection technologies:**
 - Disposable cartridge jet injectors?
 - Plastic needle?
- **Plan for Inaugural Meeting of SIGN, Geneva**

The Safe Injection Global Network (SIGN)

(www.injectionsafety.org)

- Voluntary association of stakeholders aiming to achieve safe and appropriate use of injections world-wide
- Two components
 - The SIGN associates
 - A secretariat (based at the World Health Organisation)
- Collaboration within SIGN
 - Information exchange
 - Co-ordination of communication strategies
 - Development of a common strategic framework

Associates of the Safe Injection Global Network

- International organizations and programs (WHO, UNICEF, UNAIDS, and others)
- Non Governmental Organizations (NGOs)
- Governments
- Universities
- Healthcare worker, student, and consumer organizations
- Consultants
- Industry



Injection Safety within WHO/HQ

- Inter-cluster collaborative activities : **WHO/HQ SIGN Plus** Working Group including colleagues from:
 - **EDM:** rational use of medicines
 - **HIV:** HIV Prevention and Harm Reduction units
 - **IVB:** EPI Department, Hepatitis B programme
 - **HSE:** Occupational Health ,Health Care Waste Management and Prevention of Healthcare Acquired Infections departments
 - **HRH**
 - **Patient Safety**
 - **TB Programme and Stop TB Partnership**

Use of injections worldwide (2000 data)

16+ billion injections given each year in developing countries

Immunization injections
Most vaccine are administered by injections 5% to 10%

Therapeutic injections
90 to 95% Most medications used in primary care can be administered orally

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Unsafe practices...

Syringes and needles are often just rinsed in a pot of tap water between injections.

Unsafe collection and disposal of used sharps exposes health workers and the community to risk of injury or risk.

Children scavenging dirty syringes for re-sale in Asia

Injection preparation table, Central Europe, 1998

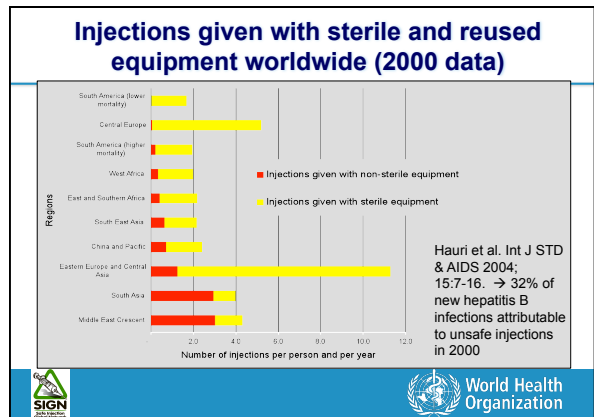
No reuse of disposable injection equipment, other breaks in safety (red circles)

A closer look at injection practices worldwide: three major areas of concern

Reuse of equipment

Unsafe disposal

Unsafe collection

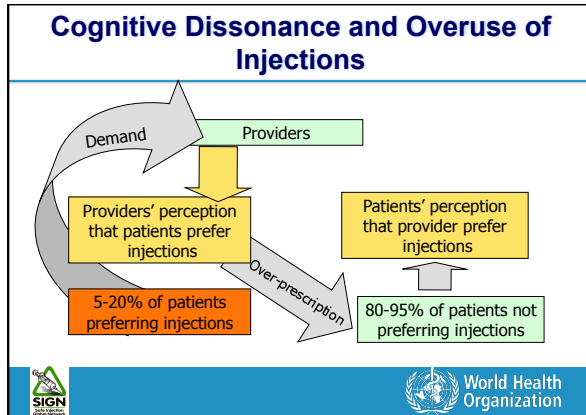


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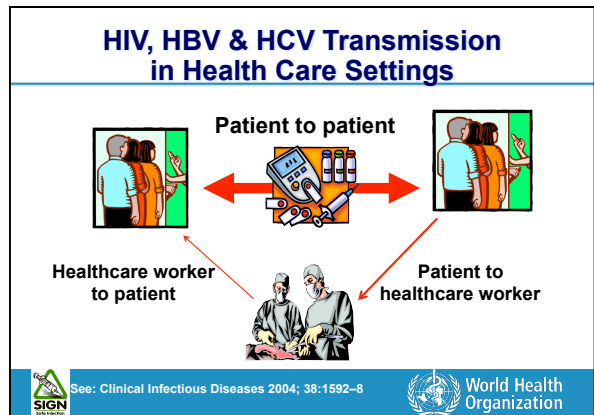


- ### Reasons for popular demand for injections
- Belief that injections are stronger medications (Pakistan)
 - Belief that injections work faster (Romania)
 - Belief that the injection pain is a marker of efficacy (South African countries)
 - Belief that a drug is more efficient when entering the body directly (Colombia, Thailand)
 - Belief that injections represent a more developed technology (many developed countries)
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- ### Motivations for overuse of injections among health-workers
- Belief of a better efficacy of injected drugs (Romania)
 - Ability to directly observe therapy and compliance with treatment regimens
 - Financial incentives (Pakistan: health care providers can charge a higher fee if they administer injections)
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- ### Reasons for unsafe injection practices
- Lack of awareness regarding the risks associated with unsafe injections
 - Lack of injection supplies
 - Lack of disposal infrastructure for injection equipment
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- ### Risks associated with unsafe injection practices
- **Blood borne pathogen transmission**
 - Hepatitis B
 - Hepatitis C
 - HIV
 - Viral hemorrhagic fevers
 - **Abscesses**
 - Septic
 - Aseptic
 - **Nerve damage with risk of paralysis**
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Selected studies indicating an association between injections and transmission of bloodborne pathogens

- HBV in Taiwan (1997)
 - 60% of new cases of infections attributable to unsafe injections
- HBV in Moldova (1994-1995)
 - 9.7% prevalence of infection in the population
 - 52% of new cases of infections attributable to unsafe injections
- HCV in Egypt (1996)
 - > 40% of new cases of infection attributable to unsafe injections
- HIV infected children in Romania (1990)



Overuse of injections and unsafe injection practices worldwide

- 16+ thousand million injection annually*
- Unsafe injection practices, annually*
 - 21 million hepatitis B infections (30% of new cases)
 - 2 million hepatitis C infections (41% of new cases)
 - 260 000 HIV/AIDS infections (5% of new cases)
- Up to **70%** of injections are given with reused syringes and needles in the developing world
- Over **70%** of injections are unnecessary in some regions

*Hutin et al,2003; Hauri et al,2004



The Seven Steps of a Safe Injection

A safe injection does not harm the **recipient**, does not expose the **provider** to any avoidable risk, and does not result in any waste that is dangerous for **other people**

- 1- Clean work space
- 2- Hand washing
- 3- Sterile syringe and needle
- 4- Sterile vial of medication and diluent
- 5- Skin cleaning
- 6- Appropriate collection of sharps
- 7- Appropriate waste management



Objectives of the Injection Safety programme

- 1. Patient Safety**
 - reduction of unnecessary injections
 - prevention of reuse of injection equipment
- 2. Health Workers' Safety**
 - NSI prevention (training, safety engineered devices, sharps boxes)
 - hepatitis B vaccination,
 - provision of Post Exposure Prophylaxis (PEP) in case of needle stick injury
- 3. Community Safety**
 - safe sharps waste management



Approaches to Prevention

- **Behaviour change** among patients and providers
 - Reduce overuse
 - Achieve injection safety
- **Provision** of sufficient quantities of appropriate injection equipment and infection control supplies
- Setting-up a **safe sharps waste management** system



Innovation in technologies: supporting safer injection practices

- **New injection devices**
 - Auto-disable (AD) syringes, Reuse Prevention (RUPs) syringes, Stick Injury Prevention (SIP) devices
 - Needleless devices
 - Pre-filled monodose injection devices
- **New options in waste management** systems
 - Thermal processing
 - Volume reduction through use of newer injection devices



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Re-use prevention + stick injury prevention devices (RUP + ANS)

Needle shields

Automatic retracting needle

Manual retracting needle

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Other safe injection technologies

For no-sharps reconstitution

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The SIGN Strategic Framework

- **Innovation in approaches**
 - **Target A:** Pilot interventions aiming at safe and appropriate use of injections
 - **Target B:** Large-scale introduction of newer technologies that support safer use of injections
- **Achieving safe and appropriate use of injections**
 - **Target C:** Implementation of national policies and plans
 - **Target D:** Injection safety in donor or lender-funded services

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Monitoring Impact

- **Process indicators**
 - Injection frequency
 - Proportion of safe injections
 - Needle stick injury rate in HCWs
- **Outcome indicators**
 - Incidence of injection-associated bloodborne pathogens infections
 - Incidence of injection-associated abscesses

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SIGN support at country level

- **Fund raising** for injection safety programmes at country level
 - GAVI, GF, CDC, USAID and other partners
- **Technical and financial support** upon request for:
 - Injection safety assessment
 - Development and implementation of injection safety programmes
 - Training workshops in injection safety and related infection control

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Areas of WHO support to countries

Monitoring & Evaluation

Identify Problems: Injection safety assessment

Development of strategies and programmes

Implementation of IS activities

Quality & Safety cycle

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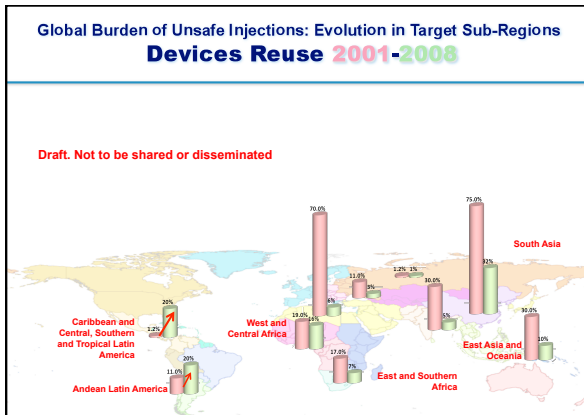
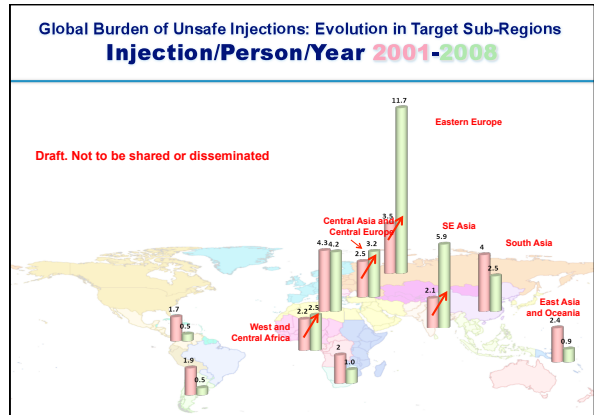
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Number of injections/person/year and reuse rate 2001-2008 by WHO Region

Region	Number of injections/ person/year		Reuse rate %	
	2001	2008	2001	2008
West and Central Africa	2.2	2.5	19	16
East and Southern Africa	2.0	1.0	17	7
Caribbean and Central, Southern and Tropical Latin America	1.7	0.5	1.2	20
Andean Latin America	1.9	0.5	11	20
North Africa and Middle East	4.3	4.2	70	6
Central Asia and Central Europe	2.5	3.2	1.2	1
Eastern Europe	3.5	11.7	11	3
Southeast Asia	2.1	5.9	30	5
South Asia	4.0	2.5	75	32
East Asia and Oceania	2.4	0.9	30	10

Draft. Not to be shared or disseminated



Total contribution of unsafe injections at Global level

Outcomes	2001		2008	
Total numb injections	16.7 billion		18.3 billion	
Reuse rate	39.6%		12.3%	
HIV	774,000 Corrected Under review	15% (corrected) Under review	178,280 Under review	7% Under review
HBV	21 million	32%	10 million	16%
HCV	2 million	40%	750,000	6%
Bacteraemia			1.6 million	3%
Abscess	Not assessed		632,000	

Draft. Not to be shared or disseminated

- In 2008**
- Reductions in unsafe therapeutic injection prevented:
 - HIV: 432,000 infections
 - HBV: 5,200,000 infections
 - Use of auto disable syringes for immunization prevented:
 - HIV: 3,000 infections
 - HBV: 151,000 infections
 - HCV: 36,000 infections
 - nosocomial bacteraemia: 86,000 infections
 - injection site abscesses: 26,500 cases
 - 806,000 HBV infections from unsafe injections prevented by HBV Vaccination
- Draft. Not to be shared or disseminated**

- Are we done with injection safety ?**
- NOT YET....**
- AD syringes: a success in immunization services.
 - RUPs and SIPs injection devices for therapeutic injections are widely available but still out of the reach of developing countries
 - Unmet needs in the curative services:
 - The number of injections is much higher
 - Unsafe practices are highly prevalent
 - The informal and private sectors are difficult to reach
- Draft. Not to be shared or disseminated**

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Are we done with injection safety ?
NOT YET....(2)

- Competing priorities in the current financial crisis
- Overuse of injections is still an issue in several countries






Unsafe injection practices also a problem in developed countries

Health Care–Associated Hepatitis B and C Virus Transmission: United States, 1998–2008*


- 33 outbreaks of HCV or/and HBV
- 448 persons acquiring HBV or HCV infection
- Over 60 000 patients at risk
- Patient-to-patient transmission through failure of health care personnel to adhere to fundamental principles related to safe injection practices (e.g. reuse of syringes or lancing devices)
- Preventable with standard precautions and aseptic technique



*Thompson et al. Ann Intern Med. 2009;150:33-39.

Conclusion

- Despite important achievements, overuse and poor injection practices are still leading to large scale bloodborne pathogen transmission
- Prevention should be achieved through multidisciplinary approaches to reduce overuse and improve safety
- SIGN provides an opportunity to exchange information, advocate together, and adopt a common strategic framework

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February 8 Behavioural Change in Infection Prevention and Control , Prof. Andreas Voss	August 8 Processing Medical Devices in Settings with Limited Resources , Dr. Nizam Damani
March 7 Achievements in Improving Injection Safety Worldwide , Dr. Selma Khamassi	September 5 Successes and Challenges in Developing and Implementing Bundles in Infection Prevention , Prof. Don Goldmann
April 17 Implementing Change: The Technical & Socio-Adaptive Aspects of Preventing Catheter-Associated Urinary Tract Infection , Prof. Sanjay Saint	October 2 The Role of Education in Low and Middle Income Countries , Prof. Shaheen Mehtar
May 7 Keeping the Hand Hygiene Agenda Alive: Acting on Data and the Influence of Global Surveys , Prof. Didier Pittet	November 7 Measuring Impact: Key to Infection Control Scale-Up and Sustainability , Prof. Jacqui Reilly
June 6 Economic Impact of Healthcare-Associated Infections in Low and Middle Income Countries , Dr. A. Nevzat Yalcin	December 5 New Developments in Infection Control for Renal Dialysis , Prof. W.H. Seto
July 11 Patient Involvement in Infection Control , Claire Kilpatrick	

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