



THE INJECTION SAFETY POLICY PLANNER

A framework to assess, plan, implement and evaluate a national policy for the safe and appropriate use of injections



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Table of contents

TABLE OF CONTENTS	2
WHAT IS THE OBJECTIVE OF THIS DOCUMENT?	3
WHO SHOULD USE THIS DOCUMENT?	3
ELEMENTS FOR A NATIONAL POLICY FOR THE SAFE AND APPROPRIATE USE OF INJECTIONS	3
1. SETTING A NATIONAL STANDARD ("BENCHMARKING")	4
<i>Rationale</i>	4
<i>Objective</i>	4
<i>Who should set the national standard?</i>	4
<i>How to make it happen?</i>	4
2. ASSESSING PRACTICES	6
<i>Rationale</i>	6
<i>Objective</i>	6
<i>Who should conduct the assessment?</i>	6
<i>How to make it happen?</i>	6
3. PLANNING FOR CHANGE	7
<i>Rationale</i>	7
<i>Objective</i>	7
<i>Who should formulate the national plan?</i>	7
<i>How to make it happen?</i>	7
4. IMPLEMENTING MULTIDISCIPLINARY INTERVENTIONS	11
<i>Rationale</i>	11
<i>Objective</i>	11
<i>Who can assist in implementation?</i>	11
<i>How to make it happen?</i>	11
5. EVALUATING IMPACT	15
<i>Rationale</i>	15
<i>Objective</i>	15
<i>Who can conduct monitoring and evaluation?</i>	15
<i>How to make it happen?</i>	15
KEY RESOURCES	16
<i>Benchmarking</i>	16
<i>Assessment tools</i>	16
<i>Planning tools</i>	16
<i>Implementation tools</i>	16
<i>Evaluation tools</i>	16
APPENDICES	17
<i>Appendix A: Best practices</i>	17
<i>Appendix B: Template agenda for national injection safety workshop</i>	19
<i>Appendix C: Burden of disease from unsafe injections</i>	20
<i>Appendix D: Cost-effectiveness of safe and appropriate use of injections</i>	21
REFERENCES	22

What is the objective of this document?

This guide is designed to assist in assessing, planning, implementing and evaluating a national policy for the safe and appropriate use of injections.

Who should use this document?

This guide was designed for national public health policy makers and their national and international partners.

Elements for a national policy for the safe and appropriate use of injections

Poor injection practices, including injection overuse and unsafe practices are common worldwide. [1] These unsafe practices may transmit bloodborne pathogens. [2] A national policy for the safe and appropriate use of injections should not be seen as a static document. Rather, it is a process by which a standard is developed, the current situation is assessed, a plan is made, actions are implemented and an evaluation measures progress. In fact, public health policies can then be seen as a "quality cycle" that includes five steps (Figure 1):

Standard setting (benchmarking)

Benchmarking defines the standard (the ideal system) and its indicators.

Assessing

Assessing consists of determining how the current system differs from the ideal one on the basis of selected indicators.

Planning

Planning allows the setting of objectives and targets to reach the ideal system.

Implementing

Implementing is about conducting interventions to reach the targets and improve the system.

Evaluating

Evaluating is done through measuring progress towards the objectives and targets.

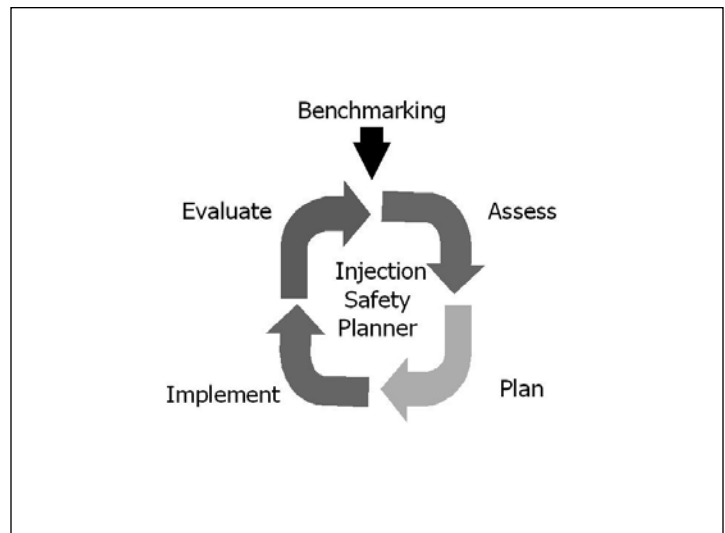


Figure 1: The quality cycle

1. Setting a national standard ("Benchmarking")

Rationale

Before engaging on an assessment of injection practices, it is useful to set a national standard. Injection practices may be described using a set of key indicators. Each of these indicators can have an ideal value (Table 1, Page 5). A national standard will define a value for each indicator so that an assessment can determine how much the current situation differs from the national standard.

Objective

Define a national standard for injection practices that will address (1) injection overuse, (2) injection safety and (3) the type of injection equipment to be used.

Who should set the national standard?

Setting a national standard requires the participation of all stakeholders, [3] including professional associations of health care workers (who will give injections), infection control practitioners (who define infection control standards), health system managers (who define standards of care) and procurement units (who purchase necessary equipment and supplies).

How to make it happen?

Injection overuse

National treatment guidelines may be used to define the clinical situations for which injections are justified.

Injection safety

The "[Best infection control practices for intradermal, subcutaneous and intramuscular injections](#)" may be used as a basis to describe the steps that make an injection safe or unsafe (Appendix A, Page 17).

Injection equipment to use

The choice of injection equipment to be recommended (sterilizable, single-use or auto-disable) may be an issue for which consensus is difficult to reach. Two elements should be taken into consideration. First, WHO best practices recommend single-use injection equipment (standard or auto-disable) for all injections. [4] Second, WHO and UNICEF recommend that all immunization services should exclusively use auto-disable injection equipment by the end of 2003. [5] Sterilizable injection equipment should only be considered if (1) sufficient quantities of single-use injection equipment cannot be made available and (2) if the quality of the sterilization is documented in registers with Time Steam Temperature (TST) spot indicators for all injections. Experience in many developing and transitional countries indicates that this second condition is rarely met and that only single-use injection equipment made available in sufficient quantities can ensure the safety of injections.

Table 1: Indicators useful to describe injection practices in a country

PROGRAMME INDICATORS (INPUTS)	IDEAL VALUE	SOURCE
I.1. HIV/AIDS prevention and care programme communicating the risk of HIV infection associated with injections	Yes	MoH
I.2. National drug policy discouraging injection overuse	Yes	MoH
I.3. Number of injectable medications on the national essential drug list	Lowest possible *	MoH
I.4. Essential drugs programme supplying syringes, needles, diluent and safety boxes in quantities matching supplies of injectable medications	Yes	MoH
I.5. Immunization and family planning services supplying auto-disable syringes and needles in quantities matching supplies of injectable vaccines and contraceptives	Yes	MoH
I.6. Health care waste management plan within the health system	Yes	MoH
DETERMINANTS OF INJECTION PRACTICES (PROCESS)	IDEAL VALUE	SOURCE
<u>Injection use</u>		
P.1. Proportion of the population reporting a preference for injections in the case of fever	< 15 %	Population
P.2. Proportion of prescribers reporting a preference for injections among patients in the case of fever	< 15% †	Prescribers
P.3. Proportion of the population recalling that the last injection received has been given at home	< 10%	Population
<u>Injection safety</u>		
P.4. Proportion of the population spontaneously reporting the risk of HIV infection associated with unsafe injections	100%	Population
P.5. Proportion of prescribers spontaneously reporting the risk of HCV infection associated with unsafe injections	100%	Prescribers
P.6. Proportion of health care facilities using sterilizable injection equipment	0%	Providers
P.7. Proportion of health care facilities using single-use injection equipment	100%	Providers
P.8. Proportion of health care facilities using auto-disable injection equipment	100% ‡	Providers
P.9. Proportion of health care facilities with stocks of single-use injection equipment (in the facility or in a nearby public or community pharmacy)	100%	Providers
P.10. Proportion of injections administered by unqualified or family providers	0%	Population
INJECTION PRACTICES (OUTCOMES)	IDEAL VALUE	SOURCE
<u>Injection use</u>		
O.1. Proportion of prescriptions including at least one injection §	Lowest possible *	Prescriptions
O.2. Average number of injections per prescription for prescriptions containing at least one injectable medication	Variable *	Prescriptions
O.3. Average number of injections per person and per year	< 1	Population
<u>Injection safety</u>		
O.4. Proportion of health care facilities where injections are given with a sterile syringe and needle	100%	Providers
O.5. Proportion of health care facilities where used injection equipment can be observed in places where they expose health care workers to needlestick injuries	0%	Providers
O.6. Annual number of needlestick injuries per injection provider	0	Providers
O.7. Proportion of health care facilities where used injection equipment can be seen in the surrounding environment	0%	Providers

* Will vary according to many factors including health care settings, standard treatment guidelines, severity of illnesses when patients seek care.

† The value of P.2 should not exceed the value of P.1.

‡ Of health care facilities giving injections for immunization or family planning.

§ Also referred to as "OT8 indicator" to monitor essential medicine policies.

2. Assessing practices

Rationale

A base of evidence is needed to define the most common and important problems so that the plan of action that will be developed is adapted to the real situation.

Objective

Engage stakeholders in a process by which they can describe injection practices on the basis of evidence.

Who should conduct the assessment?

Stakeholders' involvement in all the steps of the assessment will facilitate the future planning stage. However, the data collection step requires expertise in the planning, implementation, analysis and interpretation of surveys.

How to make it happen?

Key indicators (Table 1, Page 5) include programme indicators, indicators of the determinants of injection practices and indicators of injection practices. Two main tools are available: The "Rapid assessment and response guide" and the "Tool to assess injection safety" (Table 2).

a) The rapid assessment and response guide

"The rapid assessment and response guide" aims at engaging stakeholders in launching a planning process through the provision of a simple description of injection practices, their determinants and their consequences. It is based upon combined sampling of injection prescribers (e.g., physicians), injection providers (e.g., nurses) and the general population. It offers a wide range of sampling strategies according to the level of precision required and resources available. It emphasizes the engagement of stakeholders in data collection, analysis and use of findings.

b) The WHO tool to assess injection safety

"The WHO tool to assess injection practices" aims at estimating the proportion of health care facilities engaging in safe injection practices. It is based upon a cluster sample of 80 health care facilities.

Table 2: Compared characteristics of the two WHO assessment tools available

	Rapid assessment and response guide	Injection safety assessment
Aim	▪ Engage stakeholders to launch a planning process	▪ Estimate the proportion of injections that are unsafe
Focus	▪ Injection frequency ▪ Injection safety	▪ Injection safety
Groups surveyed	▪ General population ▪ Injection prescribers ▪ Injection providers	▪ Formal health care facilities, most often in the public sector
Precision	▪ According to sampling strategy chosen	▪ +/- 10% around estimates
Representativity	▪ According to sampling strategy chosen	▪ Satisfactory
Qualitative component	▪ Yes	▪ No
Potential users	▪ National drug policy makers ▪ Injection safety committee	▪ Expanded Programme on Immunization
Cost	▪ Around US\$ 10 000	▪ Around US\$ 20 000

3. Planning for change

Rationale

The strategy to achieve safe and appropriate use of injections has three elements (See "[Aide Mémoire" for national safe and appropriate use of injection policies](#)"). These are:

1. **Behaviour change**
Behaviour change among patients and health care workers to reduce unnecessary injections and achieve safe practices;
2. **Equipment and supplies**
Provision of sufficient quantities of injection equipment and infection control supplies;
3. **Sharps waste management.**

This three-element strategy can only be implemented if it is converted into a clear feasible national plan of action.

Objective

The three elements of the strategy for the safe and appropriate use of injections are distributed over selected programme areas that incorporate these elements into their respective plans of action.

Who should formulate the national plan?

Key Ministry of Health departments (including HIV prevention and care, essential medicines, immunization, family planning and health system) and partners can gather in a national workshop. The participants can then establish a multidisciplinary injection safety committee that meets regularly to follow up on the national policy and its implementation through the plan of action.

How to make it happen?

Template agenda for the national workshop

The national workshop can define a plan of action on the basis of the results of the assessment. A template agenda for a national planning workshop is outlined in Appendix B, Page 19.

Template national plan

A template may be used to generate a national plan of action (Table 3, Page 9). The proposed outline makes reference to specific programmes implementing specific activities. Behaviour change activities may be best conducted by the programmes on HIV prevention and care and the one on essential medicines. Provision of supplies may be best conducted by the programme of essential medicines and the other services making use of injections (e.g., immunization and family planning). Sharps waste management may be best implemented within the broader health system. In practice, the actual distribution of tasks may differ according to the organization chart of the Ministry of Health and the local situation. What actually matters is that all these activities are conducted regardless of who takes the lead in implementation. Other potential entry points include legislation and regulation of health services, quality management programmes, human resources training, health promotion, nosocomial infections, blood transfusion services and health care financing.

Priority setting

The results of the national assessment will help in setting priorities for the national plan. In addition, a mathematical model may be used to estimate the burden of disease that may be expected from unsafe injections in various regions. As part of the 2000 update of the Global Burden of Disease study, [6] WHO conducted a study to describe injection practices in 14 world regions and to estimate the burden of disease that can be expected from contaminated injections. Four regions where reuse of injection equipment in the absence of sterilization was negligible were excluded

from the analysis. In the remaining 10 regions, the annual number of injections per person ranged from 11.3 and 1.9 and the proportion of injections administered with reused equipment ranged from 75% to 1.2%. In these 10 regions, in 2000, unsafe injections may have caused 21 million HBV infections, two million HCV infections and 260 000 HIV infections, accounting for 32%, 40% and 5% of all new infections respectively. While results may vary within a given region, the table on Appendix C, Page 20, and the results of the national assessment will assist stakeholders in estimating the consequences of poor injection practices in their country so that priorities can be set.

Option appraisal

The WHO CHOICE project estimated the effectiveness and the cost-effectiveness of various health interventions. [9] The average effectiveness of interventions to reduce unnecessary injections is 30% in terms of the proportion of prescriptions including at least one injection. The average effectiveness of interventions to decrease unsafe use of injections is 95% in terms of the proportion of injections administered with reused equipment. To estimate the costs of these interventions, the start-up activities included a national planning workshop, the development and production of Information Education and Communication (IEC) material, a workshop for the training of the trainers, the training of the procurement officer and district planning workshops. The post start-up activities included the supply of injection equipment, annual national follow-up workshops, interactional group discussions between patients and health care providers and annual monitoring surveys. Interventions to reduce unnecessary injections in 2000 would cost on average US\$ 0.015 per capita and prevent 2 753 304 DALYs worldwide (Average cost effectiveness ratio: US\$ 26 per DALY averted, range by region: 7 - 5124, Appendix D, Page 21). Interventions to reduce unsafe use of injections in 2000 would cost on average US\$ 0.17 per capita and prevent 8 718 795 DALYs worldwide (Average cost-effectiveness ratio: US\$ 98 per DALY, range by region: 12-1107). Combined interventions for the safe and appropriate use of injections would cost on average in 2000 US\$ 0.18 cents per capita and prevent 8 856 461 DALYs worldwide (Average cost-effectiveness ratio: US\$ 102 per DALY, range by region: 14 - 2 293). If resources were scarce, interventions to reduce injection overuse would be preferred to interventions to reduce unsafe use as they are less costly and more cost-effective. However, the implementation of the combined intervention would avert almost three times as many DALYs with each DALY averted costing less than the annual Gross Domestic Product per capita, which makes it a sound investment in health. [7]

Setting a timeline

Once a plan is formulated, setting a timeline with designated, time-bound milestones for progress will assist in implementation.

Costing, budgeting and financing

Cost estimates for each area of work will facilitate the inclusion of these elements in the budget of the various programmes (HIV, essential drugs, immunization and health services). This costing and budgeting will also help identify sources of funds.

Table 3: Template for a plan of action for the implementation of the national policy for the safe and appropriate use of injections

1. BEHAVIOUR CHANGE			
HIV PREVENTION AND CARE PROGRAMME TO COMMUNICATE THE RISK OF HIV INFECTION ASSOCIATED WITH POOR INJECTION PRACTICES			
<u>Objectives</u>	<u>Core interventions</u>	<u>Beneficiaries/ Target groups</u>	<u>Indicators</u>
Achieve safe injection practices	Create consumer demand for new, single-use injection equipment <ul style="list-style-type: none"> ▪ Education materials ▪ Mass media 	Patients	√ Proportion of the population spontaneously reporting the risk of HIV infection associated with unsafe injections (Indicator P.4)
	Ensure use of new, single-use injection equipment <ul style="list-style-type: none"> ▪ Pre-service and in-service training 	Injection providers (e.g., nurses)	√ Proportion of health care facilities where injections are given with a sterile syringe and needle (Indicator O.4)
	Protect health care workers from needlestick injuries <ul style="list-style-type: none"> ▪ Endorsement of best practices by nursing association ▪ Pre-service and in-service training 	Injection providers (e.g., nurses)	√ Proportion of health care facilities where used injection equipment can be observed in places where they expose health care workers to needlestick injuries (Indicator O.5)
NATIONAL DRUG POLICY TO PREVENT INJECTION OVERUSE			
<u>Objectives</u>	<u>Core interventions</u>	<u>Beneficiaries/ Target groups</u>	<u>Indicators</u>
Reduce injection overuse	Promote oral medication <ul style="list-style-type: none"> ▪ Education materials ▪ Mass media 	Patients	√ Proportion of the population reporting a preference for injections in the case of fever (Indicator O.1)
	Reduce prescription of injectable medications <ul style="list-style-type: none"> ▪ Standard treatment guidelines ▪ Policy statement from medical association ▪ Interactional group discussions ▪ Reduce financial incentive to provide injections 	Injection prescribers (e.g., physicians, medical assistants, including in the private sector)	√ Proportion of prescriptions including at least one injection (Indicator O.1. also referred to as OT8)
	Reduce access to injectable medications <ul style="list-style-type: none"> ▪ Remove unnecessary injectable medications from the essential drug list 	Health facilities, pharmacies and depots	√ Number of injectable medications on the essential drug list (Indicator I.3)

2. EQUIPMENT AND SUPPLIES

ESSENTIAL DRUG SYSTEM SUPPLIES TO MAKE SYRINGES AND SHARPS BOXES AVAILABLE IN EVERY HEALTH CARE FACILITY

<u>Objectives</u>	<u>Core interventions</u>	<u>Beneficiaries/ Target groups</u>	<u>Indicators</u>
Ensure universal access to safe injection equipment and safety boxes	<p>Deliver injectable medications with matching quantities of essential equipment and supplies when procuring and distributing essential drugs</p> <ul style="list-style-type: none"> ▪ Procure syringes, needles, diluents and safety boxes for the collection of sharps ▪ Strengthen the national regulatory authority to ensure the quality of injection equipment 	Public and private health care facilities	√ Proportion of health care facilities with stocks of single-use injection equipment (in the facility or in a nearby public or community pharmacy, Indicator P.9)

IMMUNIZATION AND FAMILY PLANNING TO DELIVER INJECTABLE SUBSTANCES WITH AUTO-DISABLE SYRINGES AND SHARPS BOXES

<u>Objectives</u>	<u>Core interventions</u>	<u>Beneficiaries/ Target groups</u>	<u>Indicators</u>
Make all injectable vaccines and contraceptives available with matching quantities of injection equipment and safety boxes	<p>“Bundle” injectable vaccines and contraceptives procured by donors and lenders with essential equipment and supplies, including:</p> <ul style="list-style-type: none"> ▪ Auto-disable syringes and needles ▪ Diluents ▪ Safety boxes 	Immunization and family planning services	√ Immunization and family planning services supplying auto-disable syringes and needles in quantities matching supplies of injectable vaccines and contraceptives of services (Indicator I.5)

3. SHARPS WASTE MANAGEMENT

HEALTH CARE SYSTEM TO MANAGE SHARPS WASTE

<u>Objectives</u>	<u>Core interventions</u>	<u>Beneficiaries/ Target groups</u>	<u>Indicators</u>
Integrate sharps waste management into a comprehensive national health care waste management plan	<p>National health care waste management plan</p> <ul style="list-style-type: none"> ▪ National policy with regulatory framework ▪ Plan from waste production to disposal ▪ Training at all levels ▪ Procurement of waste treatment options 	<ul style="list-style-type: none"> ▪ Health care facilities ▪ Injection providers ▪ Communities 	√ Proportion of health care facilities where used injection equipment can be seen in the surrounding environment (Indicator O.7)

4. Implementing multidisciplinary interventions

Rationale

Safe and appropriate use of injections cannot be implemented as a separate programme, let alone a vertical one. Rather, implementation across programmes will achieve as much consistency as possible in the practices of health care workers so that evaluation can document progress.

Objective

Achieve the safe and appropriate use of injections through (1) effective communication / behaviour change interventions, (2) sufficient and continuous provision of injection equipment and infection control supplies and (3) appropriate sharps waste management that eliminates contaminated sharps from the environment.

Who can assist in implementation?

1. Communication and behaviour change will require communication experts to formulate a communication strategy, photographers, graphic designers and writers to design Information, Education and Communication (IEC) material and outreach to workers for implementation;
2. Provision of supplies will require pharmacists or administrators familiar with procurement procedures;
3. Sharps waste management will require health system specialists to manage the plan, engineers for the construction of the waste treatment options and logisticians for implementation.

How to make it happen?

1- Communication / behaviour change strategy

WHO designed a template communication strategy for the safe and appropriate use of injections (Table 4). This strategy proposes to develop six essential behaviours among patients, prescribers and injection providers. **Patients must** (1) communicate a preference for oral medications and (2) demand safe equipment when needing an injection. **Prescribers must** (3) prescribe oral drugs whenever possible. **Injection providers must** (4) use new, single-use injection equipment for each injection, (5) collect dirty sharps without recapping immediately after use in a sharps container and (6) manage sharps waste safely. Tools and details to implement the proposed communication strategy may be found in the ["Communication toolbox for the safe and appropriate use of injections"](#).

Table 4: Communication strategy for the safe and appropriate use of injections.

<i>Four problems</i>	<i>Three participant groups</i>	<i>Six key actions</i>
THERAPEUTIC INJECTION OVERUSE	Prescribers	1. Prescribe oral medications wherever possible
REUSE OF INJECTION EQUIPMENT WITHOUT STERILIZATION	Patients	2. If prescribed an injection, ask if medication can be given orally instead
		3. Demand that a syringe and needle be taken from a new, sealed and undamaged package
UNSAFE SHARPS COLLECTION	Injection providers (health care workers)	4. Use a syringe and needle from a new, sealed and undamaged package for EVERY injection
UNSAFE MANAGEMENT OF INJECTION WASTE		5. WITHOUT recapping, place syringes and needles in a safety box IMMEDIATELY after use
		6. Manage injection waste safely and appropriately

2- Provision of supplies

a) Curative health system

Lack of supplies of injection equipment lead to unsafe practices. [8] In April 2002, the WHO expert committee for essential medicines recommended that "those who supply injectable medications should also procure the equipment to administer them safely". [9] Thus, national procurement officers purchasing pharmaceuticals should ensure that orders and deliveries of injectable substances also include matching quantities of (1) single-use syringes and needles, (2) single-dose vials of diluents and (3) safety boxes for the collection of sharps waste. In some settings characterized by a high level of reuse of injection equipment, auto-disable syringes may be required instead of standard, single-use syringes. Key steps to facilitate the procurement of equipment and supplies required to ensure injection safety are summarized in Table 5 and described in more detail in "[Procuring single-use injection equipment: A practical guide](#)".

b) Immunization, family planning and other donor and lender supported programmes

In the immunization field, the "bundling" * policy statement recommends that donors and lenders who supply injectable vaccine should also supply auto-disable syringes and safety boxes for the collection of sharps.[5] Family planning services, tuberculosis control and other donor and lender supported programmes making use of injections should also procure the equipment to administer injections safely. These programmes can use the immunization "bundling" policy statement [5] as a template for the formulation of their own injection safety policy.

Table 5: The steps to follow to procure injection equipment and safety boxes at country level

Step	Objective	Tasks
Step1	Selection of injection equipment	<ul style="list-style-type: none"> ▪ Select injection equipment to be procured according to the purpose of use
Step 2	Planning injection equipment	<ul style="list-style-type: none"> ▪ Estimate quantities of injection equipment and sharps boxes
Step 3	Preparation for procurement	<ul style="list-style-type: none"> ▪ Define procurement or tender specifications ▪ Specify safe injection equipment specifications ▪ Prepare bidding documents ▪ Select potential suppliers
Step 4	Tender process	<ul style="list-style-type: none"> ▪ Select tender format ▪ Prepare bidding documents for selective tender ▪ Centralize offers for selective tender ▪ Select suppliers ▪ Issue contract ▪ Assess contract performance ▪ Evaluate product performance

* "Bundling" refers to the inclusion of the costs of auto-disable syringes and safety sharps boxes in the costs of good quality vaccines provided by donors and lenders as described in the WHO/UNICEF/UNFPA/IFRC 1999 policy statement. [5] "Bundling" has no physical connotation and does not imply that items must be "packaged" together.

C- Sharps waste management

While sharps waste constitutes a small proportion of all health care waste, it is associated with one of the highest hazards. Inclusion of sharps waste management within the broader context of health care waste management, as described in the "Aide Mémoire" for national safe health care waste management, improves effectiveness and sustainability. The key of the success is the combination of the managerial (Table 6) and technology aspects (Table 7, Page 14).

Table 6: Key elements of safe health care waste management

National policy for safe health care waste management

- Designation of responsible authority
- Regulatory framework and guidelines
- Initial assessment
- Integration into overall waste management plan
- Monitoring and evaluation

Comprehensive system of health care waste management

- Assignment of waste management responsibilities to personnel
- Allocation of resources
- Minimization of waste
- Segregation of waste
- Safe collection, handling and storage
- Safe treatment and disposal

Awareness and training

- Inclusion of waste management in the curricula of health care personnel
- National training package
- Train the trainers programme
- Education on health risks
- Education on safe practices

Selection of options for the management of health care waste

- Review of available options (See Table 7, Page 14)
- Checks of safety and environment-friendliness
- Ensure workers' safety
- Evaluation of sustainability
- Assessment acceptability
- Monitoring of safety and efficiency

Table 7: Comparison of various methods for processing/disposal of sharps waste

<i>Method</i>	<i>Strengths</i>	<i>Weaknesses</i>
Waste burial pit or encapsulation	<ul style="list-style-type: none"> ▪ Simple ▪ Inexpensive ▪ Low tech ▪ Prevents sharps-related infections/injuries to waste handlers/scavengers 	<ul style="list-style-type: none"> ▪ Potential of being unburied ▪ No volume reduction ▪ No disinfection of wastes ▪ Pit may fill quickly ▪ Not adapted for non-sharp infectious wastes ▪ Presents a danger to community if not properly buried ▪ Inappropriate in areas of heavy rain or if water table is near the surface
Burning (< 400°C), including: <ul style="list-style-type: none"> ▪ Brick oven burners ▪ Drum burners ▪ Pit burning 	<ul style="list-style-type: none"> ▪ Relatively inexpensive ▪ Minimum training required ▪ Reduction in waste volume ▪ Reduction in infectious material 	<ul style="list-style-type: none"> ▪ Incomplete combustion ▪ May not completely sterilize ▪ Results in heavy smoke ▪ May require fuel or dry waste to start burning ▪ Potential for toxic emissions (i.e. dioxins, furans) if waste stream is not properly managed
Incineration ($\geq 800^\circ\text{C}$)	<ul style="list-style-type: none"> ▪ Almost complete combustion and sterilization of used injection equipment ▪ Reduces risk of toxic emissions ▪ Greatly reduces volume of sharps waste ▪ Greater compliance with local environmental laws 	<ul style="list-style-type: none"> ▪ Relatively expensive to build, operate and maintain ▪ Requires trained personnel to operate ▪ May require fuel or dry waste to start burning ▪ Potential for toxic emissions (i.e. dioxins, furans) if waste stream is not properly managed.
Needle removal/ Needle destruction	<ul style="list-style-type: none"> ▪ Reduces occupational risks to waste handlers and scavengers ▪ Plastic and steel may be safely recycled for other uses after treatment (e.g., for buckets and coat hangers) ▪ Manual technologies available 	<ul style="list-style-type: none"> ▪ Potential needlestick injuries during needle removal ▪ Fluid splash back and needle manipulation may create opportunities of bloodborne pathogen transmission ▪ Used needles/syringes need further treatment for disposal ▪ Safety profile is not established
Melting in industrial ovens	<ul style="list-style-type: none"> ▪ Greatly reduces volume of sharps waste 	<ul style="list-style-type: none"> ▪ Expensive ▪ Requires electricity
Autoclave steam sterilization followed by shredding	<ul style="list-style-type: none"> ▪ Sterilizes used injection equipment ▪ May reduce waste volume 	<ul style="list-style-type: none"> ▪ High capital cost ▪ Requires electricity ▪ High operational costs ▪ High maintenance

5. Evaluating impact

Rationale

Monitoring and evaluation are required to document progress towards the defined national injection practices standard.

Objective

The implementation of the national plan for the safe and appropriate use of injections is monitored through a combination of input, process and outcome indicators.

Who can conduct monitoring and evaluation?

The easiest way to ensure monitoring and evaluation is to incorporate injection practices indicators into indicators routinely used to monitor the technical quality of health systems.

How to make it happen?

Indicators

The indicators to be used for monitoring and evaluation are identical to the ones used for the initial assessment (Table 1, Page 5).

Input indicators

Input indicators reflect the human and financial resources invested in the national plan for safe and appropriate use of injections.

Process indicators

Process indicators reflect the status of implementation of the various action points proposed in the national plan for safe and appropriate use of injections.

Outcome indicators

Outcome indicators reflect the evolution of injection practices in terms of frequency and safety following the implementation of the national plan for safe and appropriate use of injections.

Data collection

Data regarding indicators may be collected during supervisory visits in health care facilities and / or as part of the process of accreditation of health care facilities. In this case, the proposed indicators may be adapted (Table 8). Additional resources regarding the use of supervision visits to monitor injection practices are available in the "[Guide to supervising injection providers](#)". In the absence of a system in place for supervisory visits or accreditation, self-monitoring may be organized.

Table 8: Adaptation of injection practices indicators for use at health care facility level (e.g., for accreditation purposes)

Injectable medications supplied with matching quantities of new, single-use, syringes and needles	Yes / No
Injectable medications supplied with matching quantities of single-dose diluent vials	Yes / No
Injectable medications supplied with matching quantities of safety boxes	Yes / No
Safe management of health care waste, including sharps	Yes / No

Key resources

Benchmarking

1. Best infection control practices for intradermal, subcutaneous and intramuscular injections. WHO/BCT/DCT/01.02 (Appendix A).

Assessment tools

2. The rapid assessment and response guide
Final draft, WHO Department of Blood Safety and Clinical Technology, October 2002.
3. The WHO tool to assess injection practices
WHO/V&B/01.30
4. The WHO tool for the rapid assessment of health care waste management
(Department of the Protection of Human Environment)

Planning tools

5. "Aide Mémoire" for national safe and appropriate use of injection policies
WHO Department Blood Safety and Clinical Technology, April 2000.
6. "Aide Mémoire" for national safe health care waste management
WHO Department of Protection of the Human Environment, November 2000.

Implementation tools

7. Communication toolbox for the safe and appropriate use of injections.
WHO Department Blood Safety and Clinical Technology
8. Procuring single-use injection equipment: A practical guide
Draft 02.1, WHO Department Blood Safety and Clinical Technology, August 2002.
9. A. Pruess et al. Safe management of waste from healthcare activities. WHO, 1999.

Evaluation tools

10. Guide to supervising injection providers
Draft 1, September 2002, WHO Department Blood Safety and Clinical Technology.

Appendices

Appendix A: Best practices

Best infection control practices for skin-piercing intradermal, subcutaneous and intramuscular needle injections

***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***

Eliminating unnecessary injections is the highest priority to prevent injection-associated infections. When injections are medically indicated, they should be administered safely. These best practices are measures that have been determined through scientific evidence or expert consensus to most effectively protect patients, providers and communities.

Use sterile injection equipment

1. Use a sterile syringe and needle for each injection and to reconstitute each unit of medication.
2. Ideally, use a new, single use syringe and needle. Inspect packaging for breaches in barrier integrity. Discard a needle or syringe if the package has been punctured, torn or damaged by exposure to moisture.
3. If single-use syringes and needles are unavailable, use equipment designed for steam sterilization. Sterilize equipment according to WHO recommendations and document the quality of the sterilization process using Time, Steam, Temperature (TST) spot indicators.



Prevent contamination of injection equipment and medication

4. Prepare each injection in a clean designated area, where blood or body fluid contamination is unlikely.
5. Use single-dose vials rather than multi-dose vials.
6. If multi-dose vials must be used, always pierce the septum with a sterile needle. Avoid leaving a needle in place in the stopper of the vial.
7. Select pop-open ampoules rather than ampoules that require use of a metal file to open.
8. If using an ampoule that requires a metal file to open, protect fingers with a clean barrier (e.g., small gauze pad) when opening the ampoule.
9. Inspect for and discard medications with visible contamination or breaches of integrity (e.g., cracks, leaks).
10. Follow product-specific recommendations for use, storage and handling.
11. Discard a needle that has touched any non-sterile surface



Prevent needlestick injuries to the provider

12. Anticipate and take measures to prevent sudden patient movement during and after injection.
13. Avoid recapping and other hand manipulations of needles. If recapping is necessary, use a single-handed scoop technique.
14. Collect used syringes and needles at the point of use in an enclosed sharps container that is puncture- and leak-proof and that is sealed before completely full.



Prevent access to used needles

15. Seal sharps containers for transport to a secure area in preparation for disposal. After closing and sealing sharps containers, do not open, empty, re-use, or sell them.
16. Manage sharps waste in an efficient, safe and environment-friendly way to protect people from voluntary and accidental exposure to used injection equipment.



Other practice issues

17. Engineered technology. Whenever possible, use devices designed to prevent needlestick injury that have been shown to be effective for patients and providers. Auto-disable (AD) syringes are increasingly available to prevent re-use of injection equipment in selected settings, including immunization services.
18. Provider's hand hygiene and skin integrity. Perform hand hygiene (i.e., wash or disinfect hands) before preparing injection material and giving injections. The need for hand hygiene between each injection will vary based on the setting and whether there was contact with soil, blood or body fluids. Avoid giving injections if skin integrity is compromised by local infection or other skin condition (e.g., weeping dermatitis). Cover any small cuts.
19. Gloves. Gloves are not needed for injections. Single use gloves may be indicated if excessive bleeding is anticipated.
20. Swabbing of vial tops or ampoules. Swabbing of clean vial tops or ampoules with an antiseptic or disinfectant is unnecessary. If swabbing with an antiseptic is selected for use, use a clean, single use swab and maintain product specific recommended contact time. Do not use cotton balls stored wet in a multi-use container.
21. Skin preparation before injection. Wash skin that is visibly soiled or dirty. Swabbing of the clean skin before giving an injection is unnecessary. If swabbing with an antiseptic is selected for use, use a clean, single use swab and maintain product specific recommended contact time. Do not use cotton balls stored wet in a multi-use container.



Appendix B: Template agenda for national injection safety workshop

Template agenda for a national one-day planning workshop on a national policy for the safe and appropriate use of injections

Objectives

- Review the results of the national injection practices assessment;
- Review the draft outline of a national strategy for the safe and appropriate use of injections;
- Build a national injection safety committee;
- Obtain consensus on the key elements of the national strategy for the safe and appropriate use of injections;
- Identify next action points towards a national strategy for the safe and appropriate use of injections.

Suggested participants for the workshop and the national injection safety committee

- Relevant departments of the Ministry of Health, including HIV prevention and care, essential medicines, immunization and health system;
- Direction of preventive and direction of curative care
- National professional association (medical and nursing associations)
- Non governmental associations
- International organizations
- Bilateral partners

Agenda items

Morning : Situation analysis

1. Opening by Ministry of Health officials (30 minutes);
2. Global injection practices issues (15 minutes presentation, 15 minutes discussion)
3. Assessment results (30 minutes presentation and 30 minutes discussion)
4. HIV prevention and care activities in the country: Overview (15 minutes presentation and 15 minutes discussion)
5. National drug policy: Overview (15 minutes presentation and 15 minutes discussion)
6. Immunization safety in the country: Overview (15 minutes presentation and 15 minutes discussion)
7. Health system management: Overview (15 minutes presentation and 15 minutes discussion)

Afternoon: Proposed plans

8. Outline of a proposed injection safety plan (30 minutes presentation and 30 minutes discussion);
9. Role of HIV prevention and care in the national plan (15 minutes presentation and 15 minutes discussion)
10. Role of the national drug policy in the national plan (15 minutes presentation and 15 minutes discussion)
11. Role of immunization services in the proposed plan (15 minutes presentation and 15 minutes discussion)
12. Role of the health system in the proposed plan (15 minutes presentation and 15 minutes discussion)
13. Costing, budgeting and financing (30 minutes)
14. Next steps and action points (30 minutes)

An additional half-day break out session may be useful to develop points 9-12.

Appendix C: Burden of disease from unsafe injections

Injection practices and their consequences in terms of viral hepatitis, HIV infection and disability adjusted life years (DALYs), by region, year 2000

Global Burden of Disease regions (see country list below)

	AFR D	AFR E	AMR B	AMR D	EMR D	EUR B	EUR C	SEAR B	SEAR D	WPR B	World	
Injections per person and per year	2.2	2.0	1.7	1.9	4.3	5.2	11.3	2.1	4.0	2.4	3.4	
Proportion of reuse	19%	17%	1.2%	11%	70%	1.2%	11%	30%	75%	30%	39.8%	
Proportion of infections due to unsafe injections and	Hepatitis B virus	10.9% (8.2%-13.9%)	9.2% (6.9%-11.5%)	2.3% (0.0%-16.3%)	9.3% (0.0%-26.9%)	58.3% (26.2%-82.4%)	0.9% (0.0%-3.3%)	7.7% (1.8%-15.0%)	22.4% (16.5%-28.7%)	53.6% (21.6%-79.9%)	33.6% (0.0%-79.0%)	31.9% (9.4%-56.9%)
	Hepatitis C virus	16.4% (12.3%-20.8%)	13.0% (9.8%-16.2%)	0.9% (0.0%-6.4%)	9.2% (0.0%-26.7%)	81.7% (52.1%-95.0%)	0.9% (0.0%-3.4%)	21.2% (6.1%-34.7%)	30.8% (22.8%-39.2%)	59.5% (40.4%-93.6%)	37.6% (0.0%-89.8%)	39.9% (18.2%-66.7%)
	HIV	2.5% (1.9%-3.1%)	2.5% (1.9%-3.1%)	0.2% (0.0%-1.5%)	1.5% (0.0%-4.5%)	7.1% (5.7%-8.5%)	0.0% (0.0%-0.0%)	0.6% (0.2%-1.2%)	7.0% (5.2%-8.9%)	24.3% (18.3%-30.1%)	2.5% (0.0%-5.9%)	5.4% (3.9%-7.0%)
Total burden in DALYs 2000-2030	555 644	1 668 583	9 083	27 332	559 702	3 479	64 733	280 789	4 720 866	1 287 470	9 177 679	

GLOBAL BURDEN OF DISEASE REGIONS: **Afr D includes:** Algeria, Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Chad, Comoros, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Madagascar, Mali, Mauritania, Mauritius, Niger, Nigeria, Sao Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Togo. **Afr E includes:** Botswana, Burundi, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Eritrea, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia, Zimbabwe. **Amr B includes:** Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela. **Amr D includes:** Bolivia, Ecuador, Guatemala, Haiti, Nicaragua, Peru. **Emr D includes:** Afghanistan, Djibouti, Egypt, Iraq, Morocco, Pakistan, Somalia, Sudan, Yemen. **Eur B includes:** Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Poland, Romania, Slovakia, Tajikistan, The Former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Uzbekistan, Yugoslavia. **Eur C includes:** Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Ukraine. **Sear B includes:** Indonesia, Sri Lanka, Thailand. **Sear D includes:** Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Maldives, Myanmar, Nepal. **Wpr B includes:** Cambodia, China, Cook Islands, Fiji, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia (Federated States of), Mongolia, Nauru, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam

Appendix D: Cost-effectiveness of safe and appropriate use of injections

Cost-effectiveness ratio of interventions to reduce injection overuse, reduce unsafe use of injections and the combination, by region.

Cost per discounted and age-adjusted DALY averted

	GDP US\$ / capita	Reduction of injection overuse	Reduction of unsafe use of injections		Combined interventions	
			<i>Without waste collection and management</i>	With sharps waste collection and management	<i>Without waste collection and management</i>	With sharps waste collection and management
AFR D	1 381	16.4	24.8	39.4	28.1	42.4
AFR E	1 576	6.6	7.8	12.4	9.1	13.6
AMR B	7 833	3 862.0	447.2	499.0	1 333.7	1 384.7
AMR D	3 837	131.8	64.9	97.0	93.1	124.7
EMR D	2 393	23.1	170.5	282.2	172.8	282.8
EUR B	7 294	5 123.6	1 013.1	1 106.7	2 200.5	2 292.6
EUR C	6 916	272.8	139.0	213.3	198.6	271.8
SEAR B	2 545	42.4	62.0	100.3	70.4	108.1
SEAR D	1 449	7.5	61.8	102.3	62.5	102.4
WPR B	4 186	66.2	77.8	125.1	91.7	138.2
Total		26.1	59.9	97.8	64.9	102.2

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