AIDSTAR-Two Project Trip Report – Vietnam 12/04/10

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5 key words:

HSS, MARPS, Vietnam, HIV, epidemiology

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AIDSTAR-Two
Management Sciences for Health
4301 N. Fairfax Drive
Arlington, VA 22203
Telephone: (703) 524-6575
www.msh.org

AIDSTAR-Two Project Trip Report

1. Scope of Work:

Destination and Client(s)/ Partner(s)	Vietnam; AIDSTAR-Two HSS for MARPS activity
Traveler(s) Name, Role	Dan Kraushaar
Date of travel on Trip	December 4-17, 2010
Purpose of trip	Continue working on HSS for MARPS SOW
Objectives/Activities/ Deliverables	Finalize epidemiology. Start looking at health systems issues for MARPS
Background/Context, if appropriate.	Working in collaboration with the HSS Technical Working Group, the Office of HIV AIDS, USAID local missions, CSS implementers, MARPs and various other stakeholders, AIDSTAR- Two will design and apply a unique analytical framework that seeks to accomplish the following objectives: • Identify the system weaknesses that hinder supply and demand of services for MARPs • Determine system requirements for the delivery of effective minimum package of services to MARPS and corresponding supportive interventions • Assess the importance and service delivery impact of health and community system strengthening activities for delivering key services for MARPs • Outline a methodology to prioritize system strengthening interventions in various settings and document best practices in service delivery to MARPs • Build consensus among stakeholders on the guidelines.

2. Major Trip Accomplishments: Should include the major programmatic goals realized, relevant metrics, and stories of impact from the trip.

Completed epidemiologic analysis of HSS for MARPS
Presented same to USAID Vietnam

3. Next steps: Key actions to continue and/or complete work from trip.

Description of task	Responsible staff	Due date
Work on health systems analysis and health systems strengthening recommendations	**Kraushaar**	**January**
Complete any remaining work on MARPS HIV epidemiology and intervention effectiveness.	**Oanh and Elden**	**ASAP**

4. Contacts: List key individuals contacted during your trip, including the contacts' organization, all contact information, and brief notes on interactions with the person.

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AIDSTAR-Two
capacity for impact

AIDSTAR-Two Project Trip Report

Name	Contact info	Home organization	Notes
Xerses Sidhwa	USAID Vietnam	USAID Vietnam	Other USAID and CDC people attended our presentation but I did not interact with them.
Dr. Tum	Deputy COP	Abt Health Policy Initiative	
Dr. Khan	Technical Officer	PSI (ex Director of Research)	
Mr. Tran Tien Duc	Former Director of Health Policy Initiative	Freelance consultant	
Mr. e Ngoc Bal	Deputy Country Representative	Pathfinder	
Michael Wilson	Senior Tech. Advisor	SCMS Project	
Mr. Mawaya	Technical Officer	WHO Vietnam	AIDS care and treatment
Ngoc	Head, Health Care and Treatment team	USAID Vietnam	
Sarah Bales	Independent consultant to MOH Vietnam		
Khuat Thi Hai Oanh	Our local consultant		

5. Description of Relevant Documents / Addendums: Give the document's file name, a brief description of the relevant document's value to other staff, as well as the document's location in eRooms or the MSH network. Examples could include finalized products and/or formal presentations, TraiNet Participant List, Participant Contact sheet, and Meeting/Workshop Participant Evaluation form are examples of relevant documents.

The following files were written prior to this visit for the purpose of this visit or written while I was in .

File name	Description of file	Location of file
USAID presentation Dec 10_Dan and Oanh	Presentation to USAID on HIV MARPS epidemiology	AIDSTAR-Two, HSS MARPs eroom
USAID VN presentation Dan and Oanh edited Dec 11	As above but with a few additional slides	AIDSTAR-Two, HSS MARPs eroom
CE interventions by type and target population IETNAM 12-14b	List and evidence for HIS prevention cost effectiveness.	AIDSTAR-Two, HSS MARPs eroom
Draft effectiveness of interventions in MARPS	Initial draft of summary of HIV prevention interventions for MARPS	AIDSTAR-Two, HSS MARPs eroom
Drat summary of evidence on reducing HIV transmission in MARPS	Additional summary information on prevention intervention effectiveness.	AIDSTAR-Two, HSS MARPs eroom
Draft thoughts from reading Lancet prevention series papers	Relevant excerpts from Lancet HIV prevention series	AIDSTAR-Two, HSS MARPs eroom
Definitions of health system building blocks	Summary definitions of HS building blocks from WHO	AIDSTAR-Two, HSS MARPs eroom

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	Everybody's Business paper	

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“Fit for purpose” health systems strengthening for reducing HIV transmission in most at risk populations in Vietnam

AIDSTAR II

Khuat Thi Hai Oanh
Dan Kraushaar
Elden Chamberlain

USAID Vietnam 10 December 2010

Four Deliverables

1. Situational analysis and synthesis document in two parts:

   Part I: Situational analyses (Vietnam and Jamaica).

   Part II: HSS investment strategy for reducing HIV transmission in MARPS.

2. Summary guidance document for each country in sections which correspond to the work plan
3. Analytic and operational framework which would document this entire process

Methodology and sequence of analysis

1. Understand the epidemiology of HIV transmission (people, place, time, proximal and distal risk factors)
2. Identify the causal chain of HIV transmission and the critical points of intervention
3. Identify the vital few evidence based interventions appropriate for points of intervention
4. Determine system requirements and critical system bottlenecks
5. Determine system strengthening needs to overcome bottlenecks and improve effective coverage

Integrating causal thinking into HSS

Epidemiological causal analysis

- Describe the desired outcome
- Describe the problems to be overcome
- Identify direct and indirect causes and risk factors
- Determine characteristics of the populations at risk
- Identify evidence based interventions to address causes and risk factors
- Define baselines and target coverage levels

Health systems causal analysis

- Identify health system requirements for those interventions
- Describe health system bottlenecks, problems and causes, contributing factors
- Identify health system strengthening interventions
- Identify indicators of performance

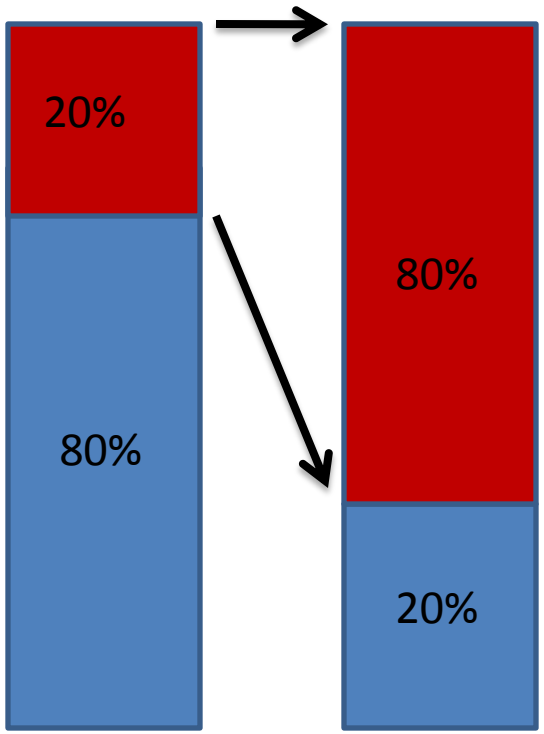
RESULT: A tailored HSS program focused on achieving health outcomes.

We can't do everything: Focus on the 80/20 problems, causes, risk factors, interventions

80% of the problem comes from 20% of the causes

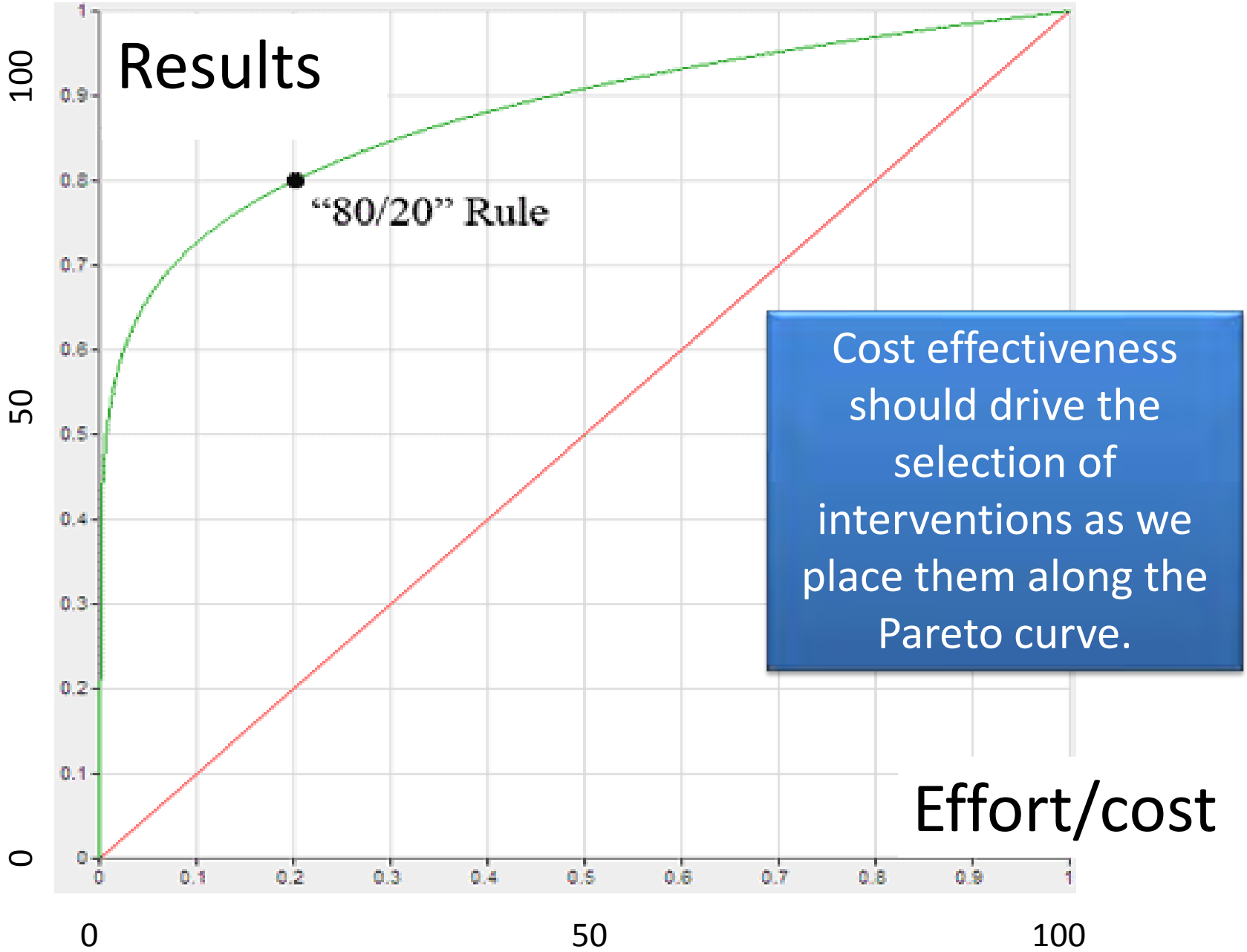
80% of causes are driven by 20%of the risk factors.

20% of the effort produces 80% of the results.



80% of the impact comes from 20% of the interventions

80% of system improvements come from 20% of the system strengthening efforts.


Results
"80/20" Rule
Cost effectiveness should drive the selection of interventions as we place them along the Pareto curve.
Effort/cost
100
50
0
0
50
100
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Understand the epidemic

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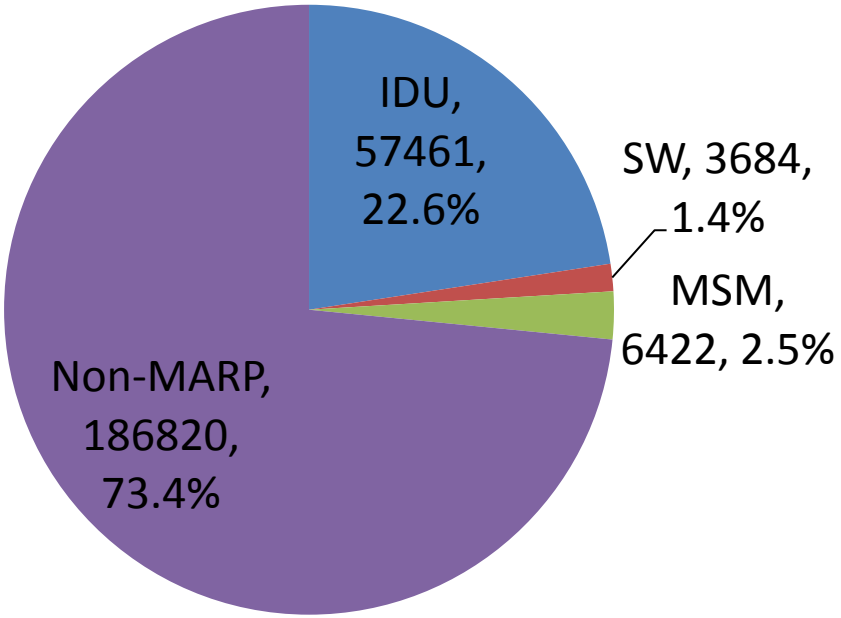
Back-calculation using estimates and projection data – MSM assumption 1

- IDU:
  - low scenario: MOLISA reported number
  - High scenario: reported number applied a multiplier
  - Prevalence: 12 - 56%
  - Adjust HIV prevalent for NW to level of NE
- SW:
  - low scenario: MOLISA reported number
  - High scenario: 3 folds of reported
  - Prevalence: 1 – 22%
- MSM:
  - Low: 1% of men in Hanoi and HCMC and 0.5% in other provinces
  - high: 3% and 1.5%
  - Prevalence: 2% (as of STI patients)

Distribution of HIV cases – 2010
Medium scenario – total 254,387

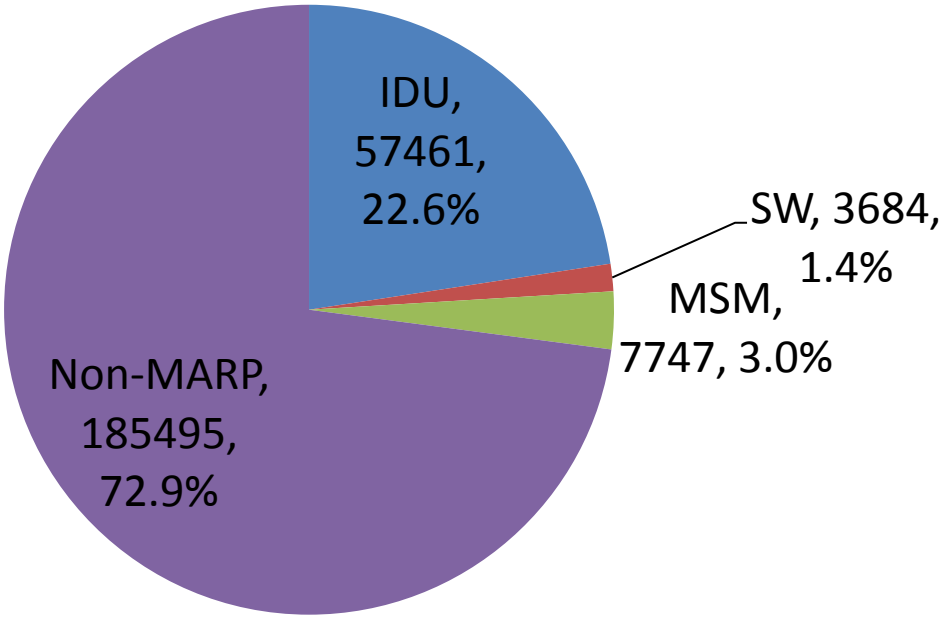


WORKING DRAFT

Back-calculation using estimates and projection data – MSM assumption 2

- MSM:
  - Low: 1% of men in Hanoi and HCMC and 0.5% in other provinces
  - high: 3% and 1.5%
  - # of gay men practising MSM
    - Big cities: one third
    - Other places: 20%
  - Prevalence:
    - Using IBBS data where available
    - Use 2% for other places

Distribution of HIV cases – 2010
Medium scenario – total 254,387



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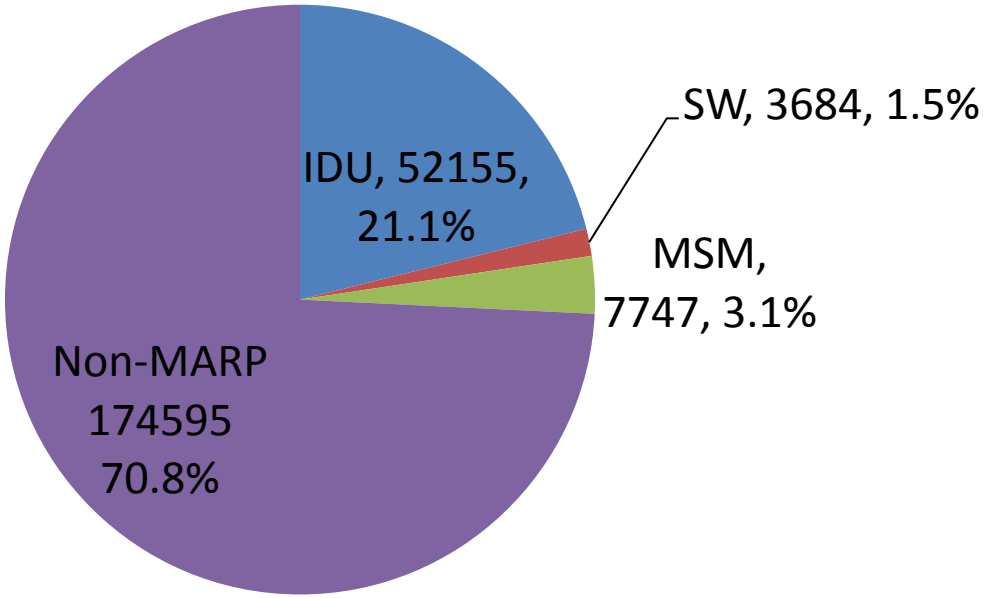
Adjusting IDU population size

- IDU population size for high scenario in Estimate and Projection was on average 2.45 times higher than the registered number of IDUs.
- IDU representatives believe that the official registered number accounts for at least 65% of IDUs in the community. Therefore, we estimate IDU population size to be **registered number/65%** = 171,127 (medium)
- Prevalence among IDU is kept – total infections among IDUs is reduced by 7,623 cases → deduction in total infections to **246,764**

Back-calculation using IDU-adjusted data

Distribution of HIV prevalent cases - 2010
Estimate and Projection data with adjusted IDU number
Total: 246,764



At risk populations

Primary sexual partner of IDU (Non-IDU/SW)

General men

Non-MARP PLHIV

General women

Male drug users

F. Drug users

FSW

Male clients

MSM

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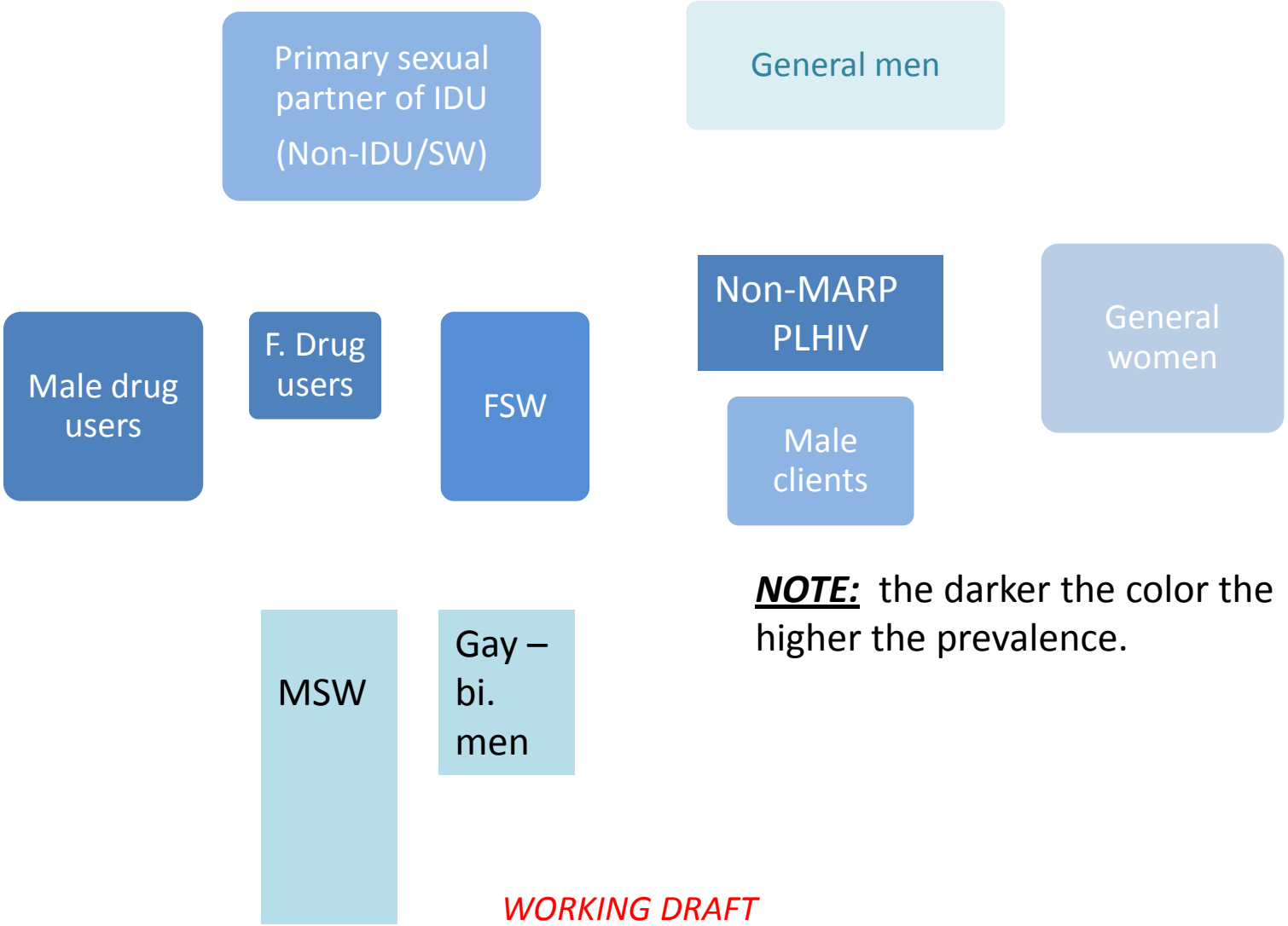
At risk populations by prevalence



NOTE: the darker the color the higher the prevalence.

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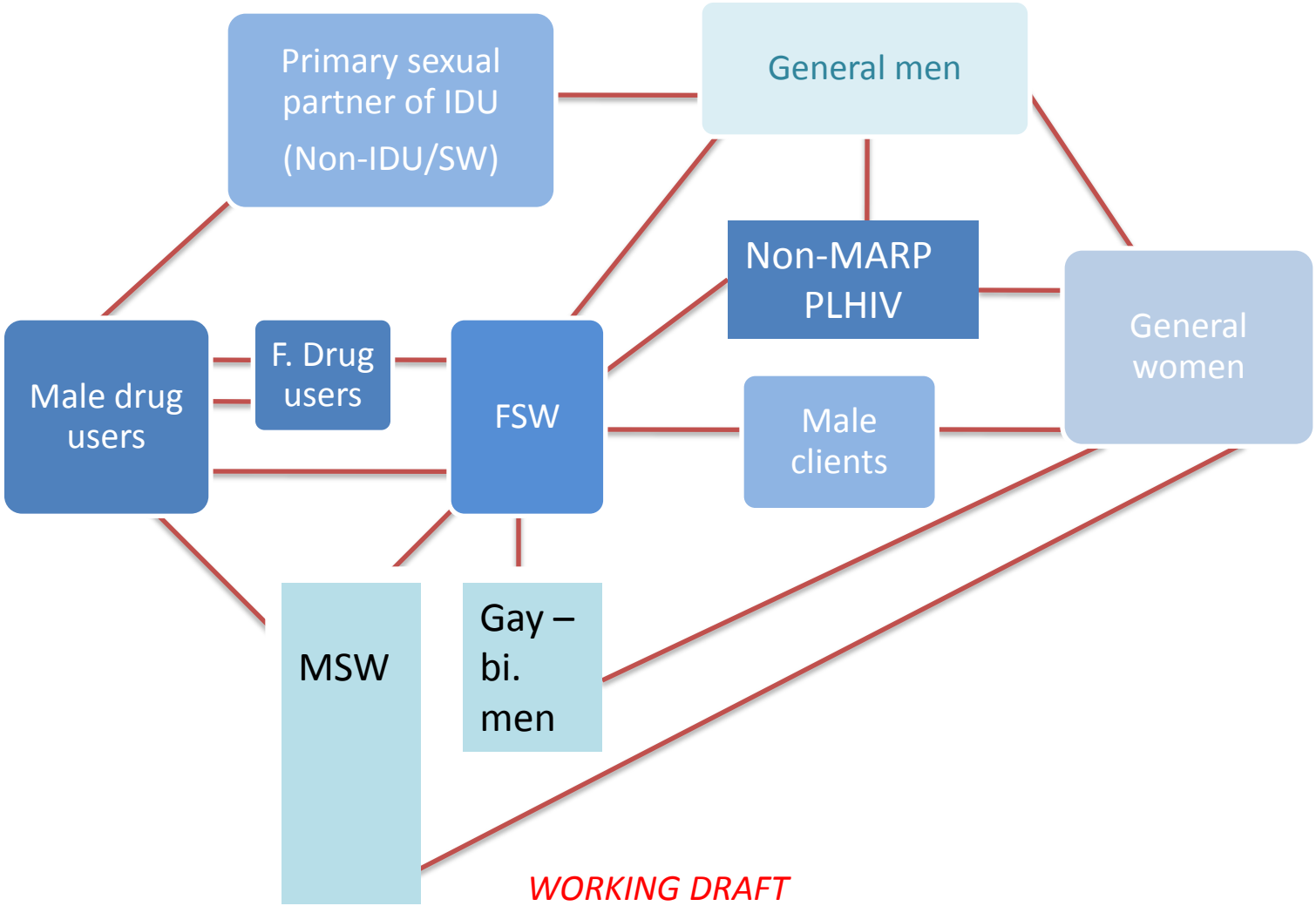
Interactions among high risk populations



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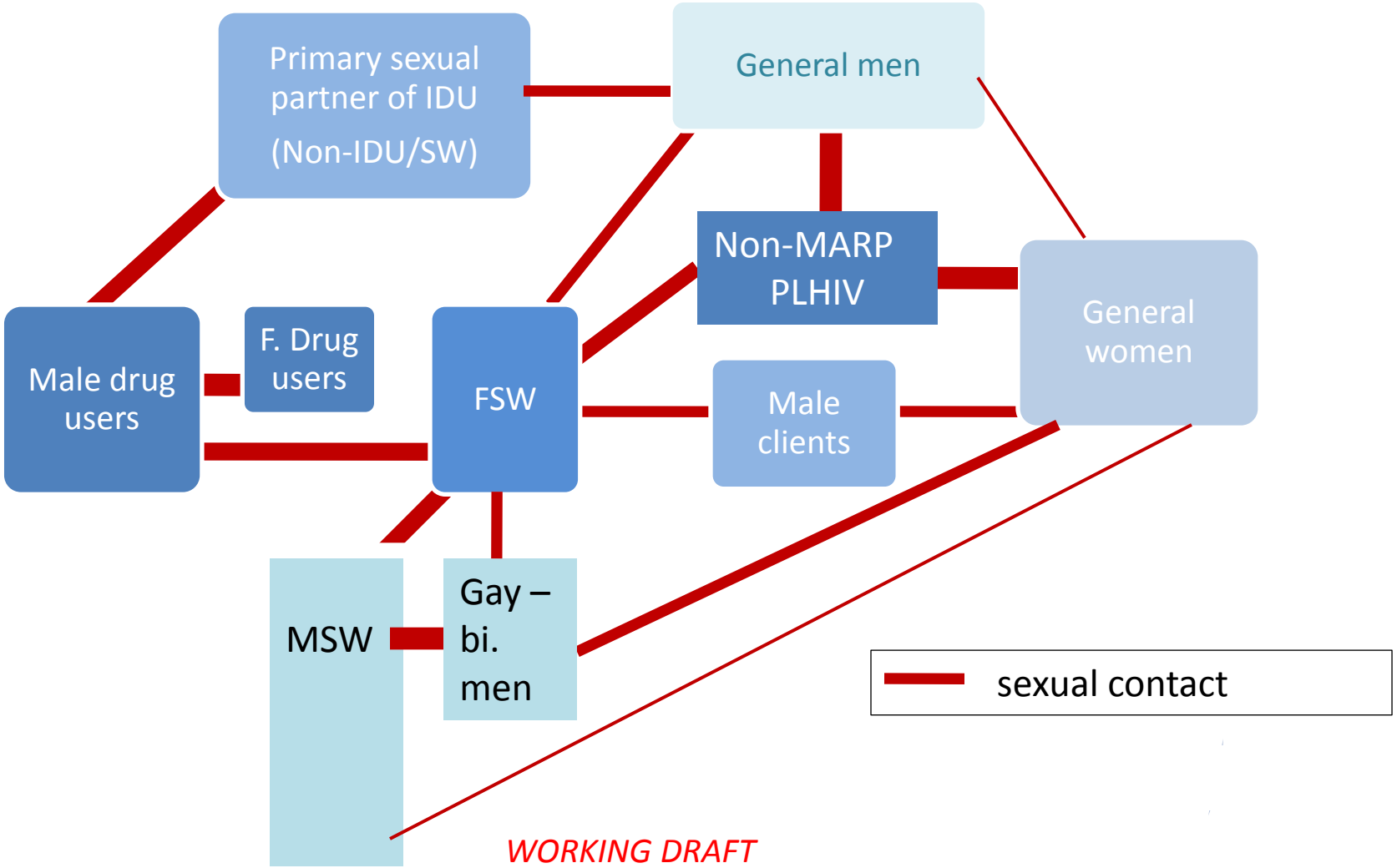
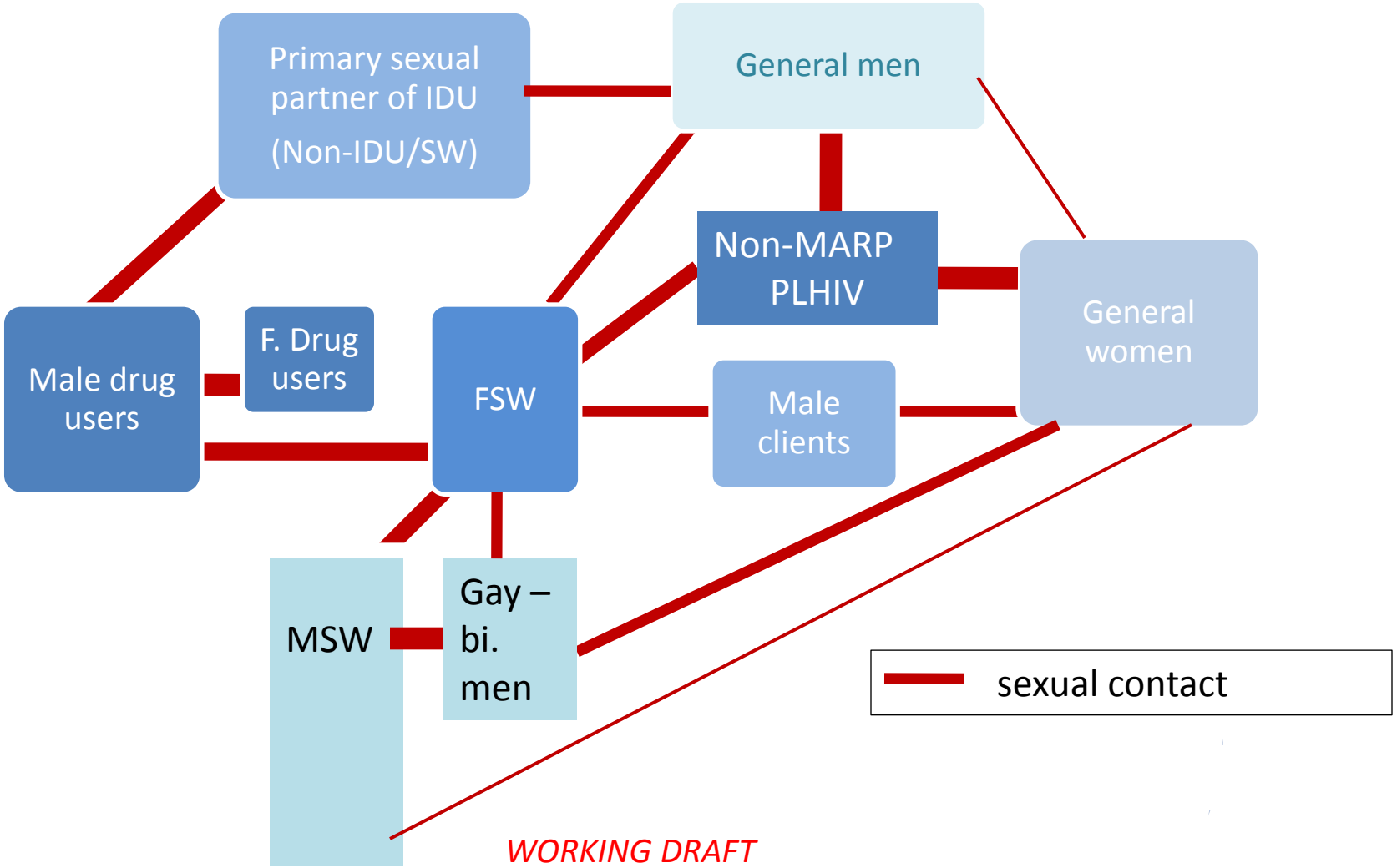
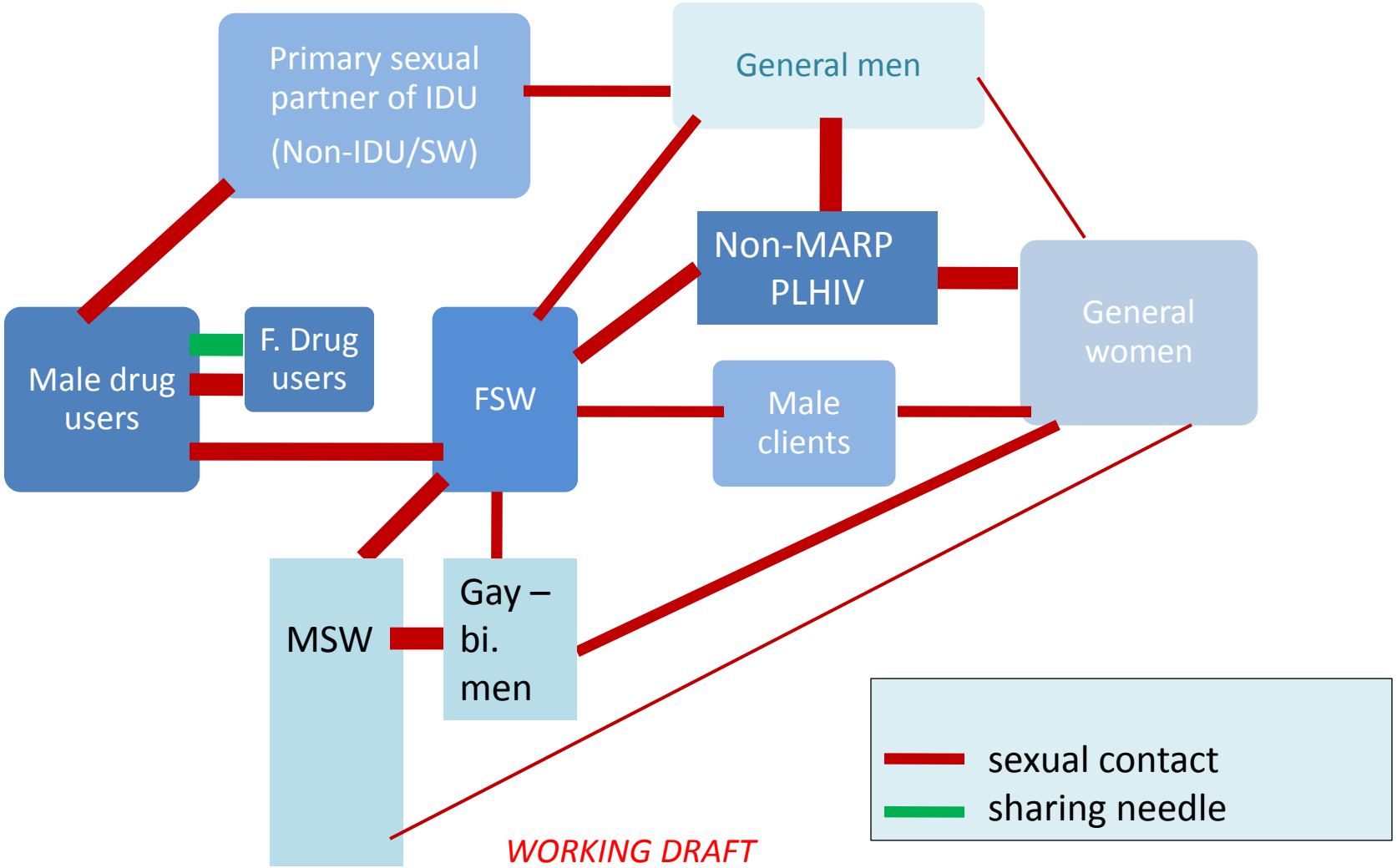
Network of transmission



General direction of transmission



Method of transmission
Mostly by sexual contact



Evidence on transmission network (1)

- IDU sharing needles:
  - Share during last injection: IDU 3% (IBBS), FIDU: 9% in Hanoi, 19% in HCMC (ADRA)
- DU-SW interaction:
  - FIDU sell sex as main income: HN 67% & HCM 34% (ADRA)
  - SSW inject: 1 – 30% (IBBS)
  - SSW has injecting sex partners: regular clients: 1-15%, regular partner: 0-21% (IBBS)
  - MIDU had sex with SW: 2 – 18% (IBBS)
- SW – general men interaction: not all regular partners are drug users (IBBS), 5% & 19% FIDU has non-injecting partners (ADRA).
- FIDU-MIDU interaction: 70 & 73% of FIDU's partners use drug, FIDU share with partner/friend (ADRA)
- PSP risk: IDU reported having sex with PSP past 12 months: 40 – 75% (IBBS), HIV prevalence: 14% (Abt)

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Evidence on transmission network (2)

- MSM sexual risk: sex wt MSW past month: 3.7 – 7.8%, sex with FSW: 4 – 25% (IBBS)
- MSM – DU interaction: 10 – 32% ever used drug, 1-11% ever injected, partner injected: 3 – 34% (IBBS)
- MSM – general women: sex wt female partner past 12 months: 29 – 49%, sold sex to female client: 0 – 14%, married to a woman: 9 – 19% (IBBS)
- PLHIV transmission risk: 67% male got HIV thru injecting, 88% female for thru heterosexual , 73% of of male and 66% of female have regular partners, 47% & 15% are negative or unknown status , 17% of male and 34% of female did not consistently use condom with negative/unknown-status partner, 25% of MLHIV reported having sex with SW after knowing their status (ISDS/VCSPA)
- PSP – general men: turnover of PSP, annecdotal evidence of PSP have other non-injecting partner who are married or in relationship with other women

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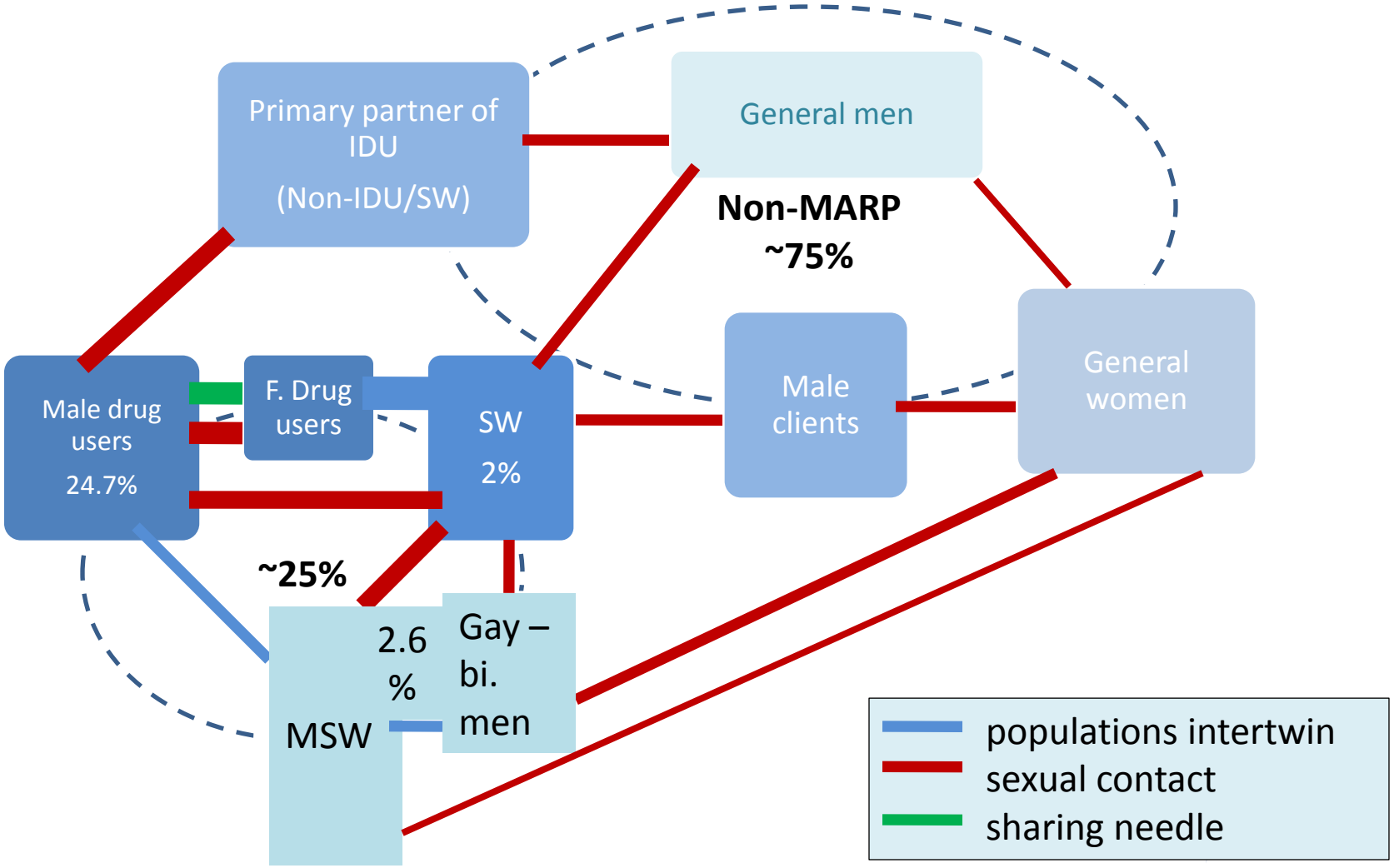
Distribution of current HIV infections



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Prevalent cases
MARPs vs non-MARP men and women

		MARP		Non-MARP	
		#	%	#	%
Male	Prevalent (186,707)	53,362	28.6%	133,345	71.4%
Female	Prevalent (67,680)	8,900	13%	58,780	87%

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Distribution of new infections

- Using population size, incidence rates to calculate new infections in each population
  - IDU: 5.2% (Vu Minh Quan, 2010)
  - SW: 1% - own estimation using sentinel and IBBS data
  - MSM: 4% (as suggested by IBBS data)
- Total new infections in 2011 = # of PLHIV in 2011 – # of PLHIV in 2010 + # of AIDS deaths in 2011

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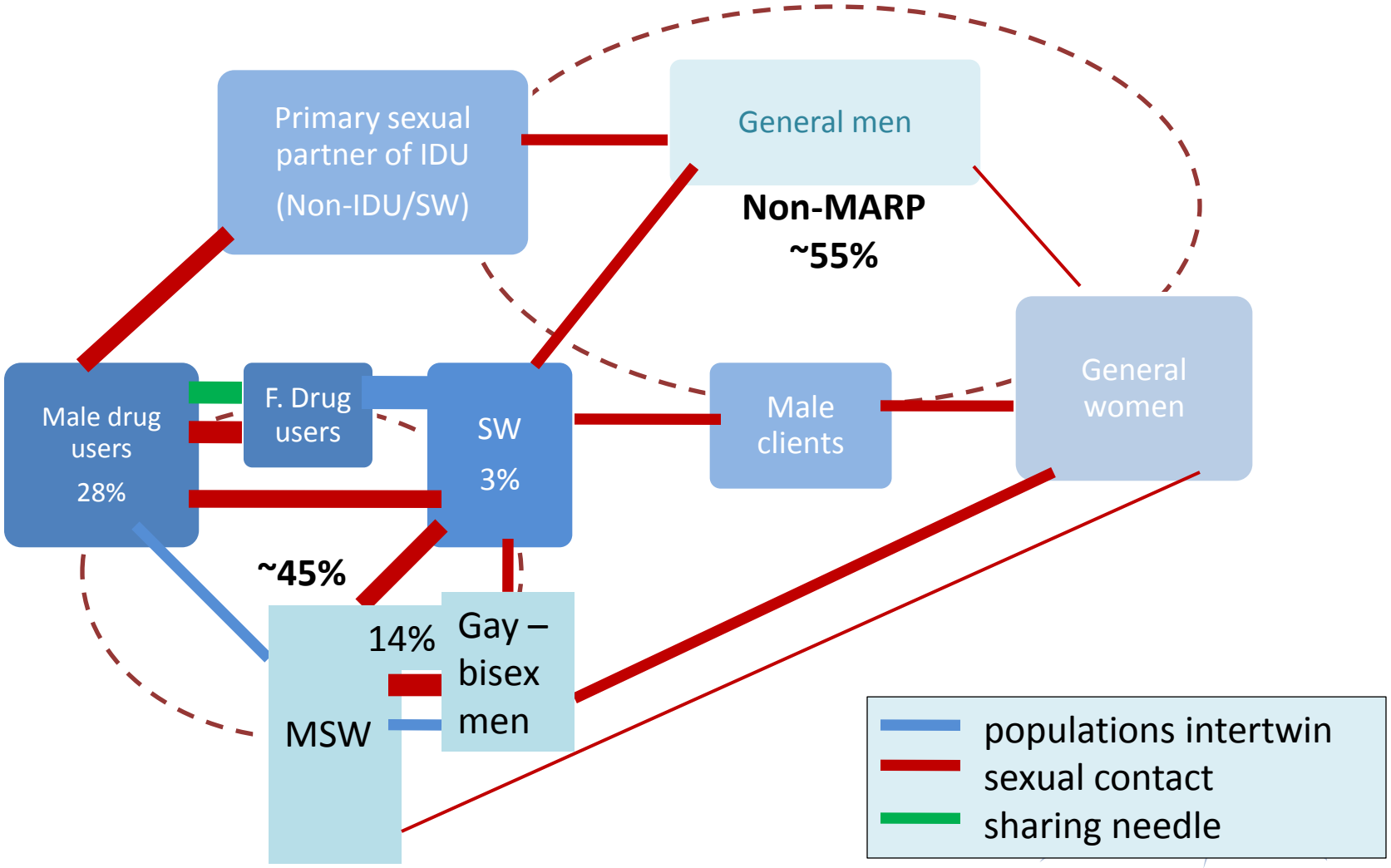
New Infections – total 21,155



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MARPs drive new infections

- Male MARP: 25% + 14% = 39%

- Female drug users: 3%
- Female SW: 3%

→Likely to cause 20% of new infections among male clients of SW

Total MARP/MARP-driven = 65% of total new infections

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MARPs sub-groups to be targeted

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Risk of INFECTION vs. reach

High risk

-Venue-based MSW -Undisclosed gay -Unregistered IDU -IDU in closed settings -Call-girl, mobile SW -ATS-using SW, MSM, IDU -Spouses of undisclosed/untreated PLHIV -Spouses of MSM - Long-term non-IDU partners of F/MSW -Regular clients of F/MSW -Clients of injecting SWs -Migrant/mobile workers	-Female IDU -Injecting MSM -Registered IDU -IDU-partner of FSW -Street-based SW -Street-based MSW -Open gay -STD patients seeking treatment in facilities -Spouses of registered IDUs -Spouses of disclosed/untreated PLHIV
- Clients of non-injecting SW	-Spouses of treated PLHIV

Difficult to reach

Easy to reach

Lower risk

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Risk of TRANSMISSION vs. reach

High risk

Difficult to reach	Easy to reach
-Positive MSM -Venue-based MSW -Undisclosed gay -Call-girl, mobile SW -Untreated positive SW, IDU -PLHIV who don't know status -Undisclosed/untreated PLHIV -ATS-using M/FSW, MSM, IDU -IDUs in cities implementing zero-tolerant policy -IDU in closed settings -Migrant/mobile workers	-Female IDU -Injecting MSM -Street-based SW -Street-based MSW -Open gay -Registered IDU - STD patients seek treatment in clinics -Spouses of registered IDUs -STD patients seeking treatment in facilities
-Spouses of MSM - Long-term non-IDU partners of F/MSW -Clients of SW	- Spouses of treated PLHIV

Lower risk

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Who are the MARP? Where to find them?

	IDU		SW		MSM	
	Share of IDU+	Share of IDU-	Share of SW+	Share of SW-	Share of MSM	Share of MSM+
North West	21.3%	27%	8.3%	5.2%	8.6%	?
Hai Phong	7.1%	(1.8%)	11.9%	(2.9%)	(2%)	*
Red River delta	11%	12.4%	10.8%	4.6%	12.6%	*
South East				9.5%	8.1%	*
Mekong delta			11.5%	9.8%	15.3%	*
Hanoi	16.6%	13.7%	10.7%	5.2%	7.4%	***
HCMC	24.7%	12.1%	17.4%	35.6%	13.3%	***
Can Tho					1.4%	*
SUM	80.7%	65.1% (66.9%)	70.6%	69.7% (72.6%)	66.7% (68.7%)	

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Which interventions to be prioritized?

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Risk factors associated with new infections among IDU

- **Share syringe/needles**
  - Lack of clean N/S
    - Unavailability (odd hours), closed settings
    - Access denied
    - Fear of being arrested
    - Craving - cognitive impairment
    - Shortage of money
    - Free needles not appropriate
  - Share drug
    - Shortage of money
  - Injecting sexual partner
    - - Sexual partner (SP)'s injection-related risk
    - - SP's sexual risk
    - - Low condom use
- **ARV access**
- **Aware of HIV status**
- **Unsafe sex**
  - SW as regular partner
    - - SP's sexual risk
    - - Low condom use
    - - STI
  - SW
    - - SP's sexual risk
    - - STI
  - Casual partner
    - - SP's sexual risk
    - - Low condom use
  - Sex client
    - - Anal sex
    - - Gangrape
    - - Group sex
    - - Sex without condom
  - **Use of stimulant**
- **Tatoo**
  - Lack of safe equipmt (closed setting)

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Needs for data – IBSS analysis

- Characteristics of MARP(+)
- Characteristics of MARP(-)
- Which sub-group(s) of MARP(+) exhibit the highest risk behaviours?
- Which sub-group(s) of MARP(-) exhibit the highest risk behaviours?

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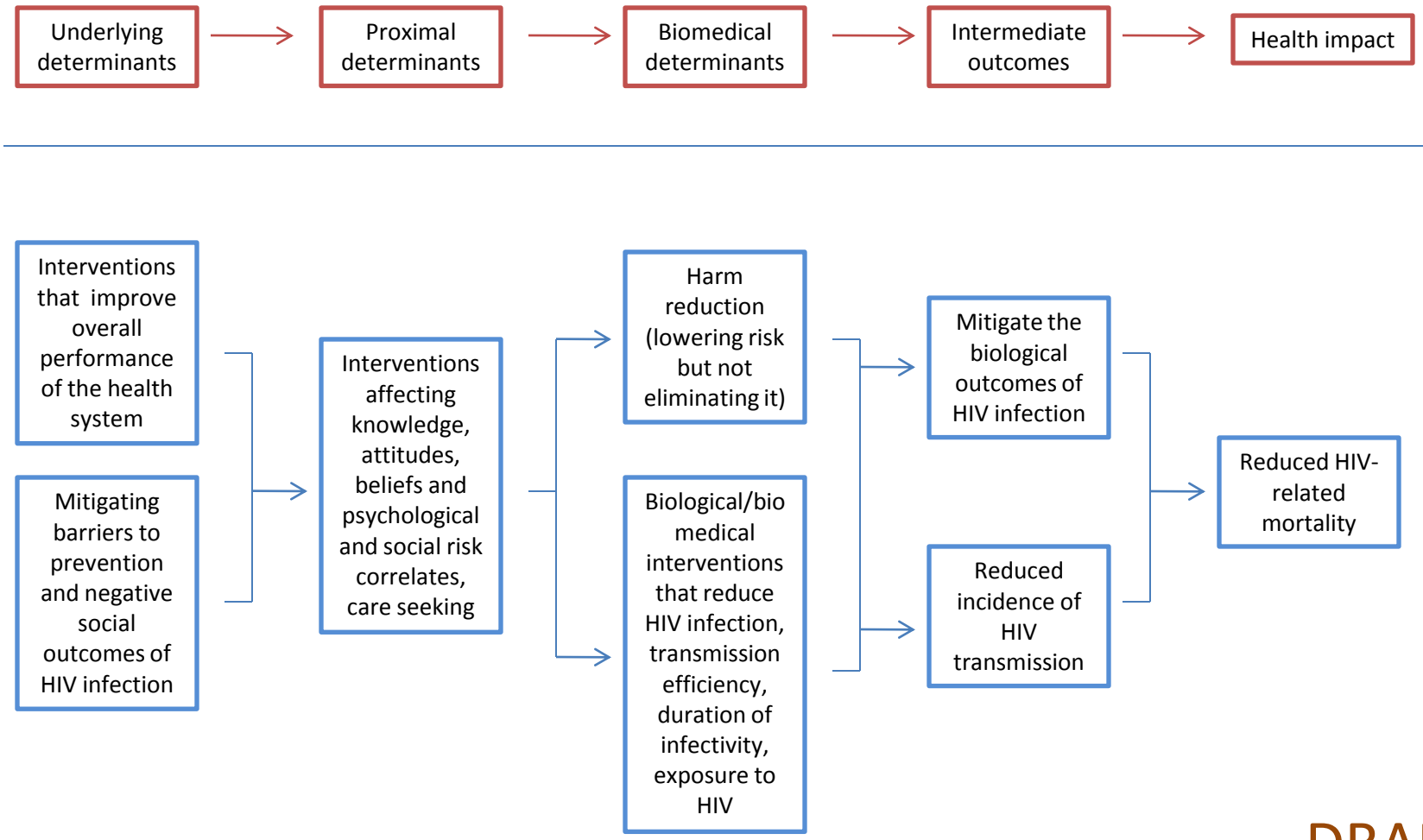
Intervention points along causal pathway



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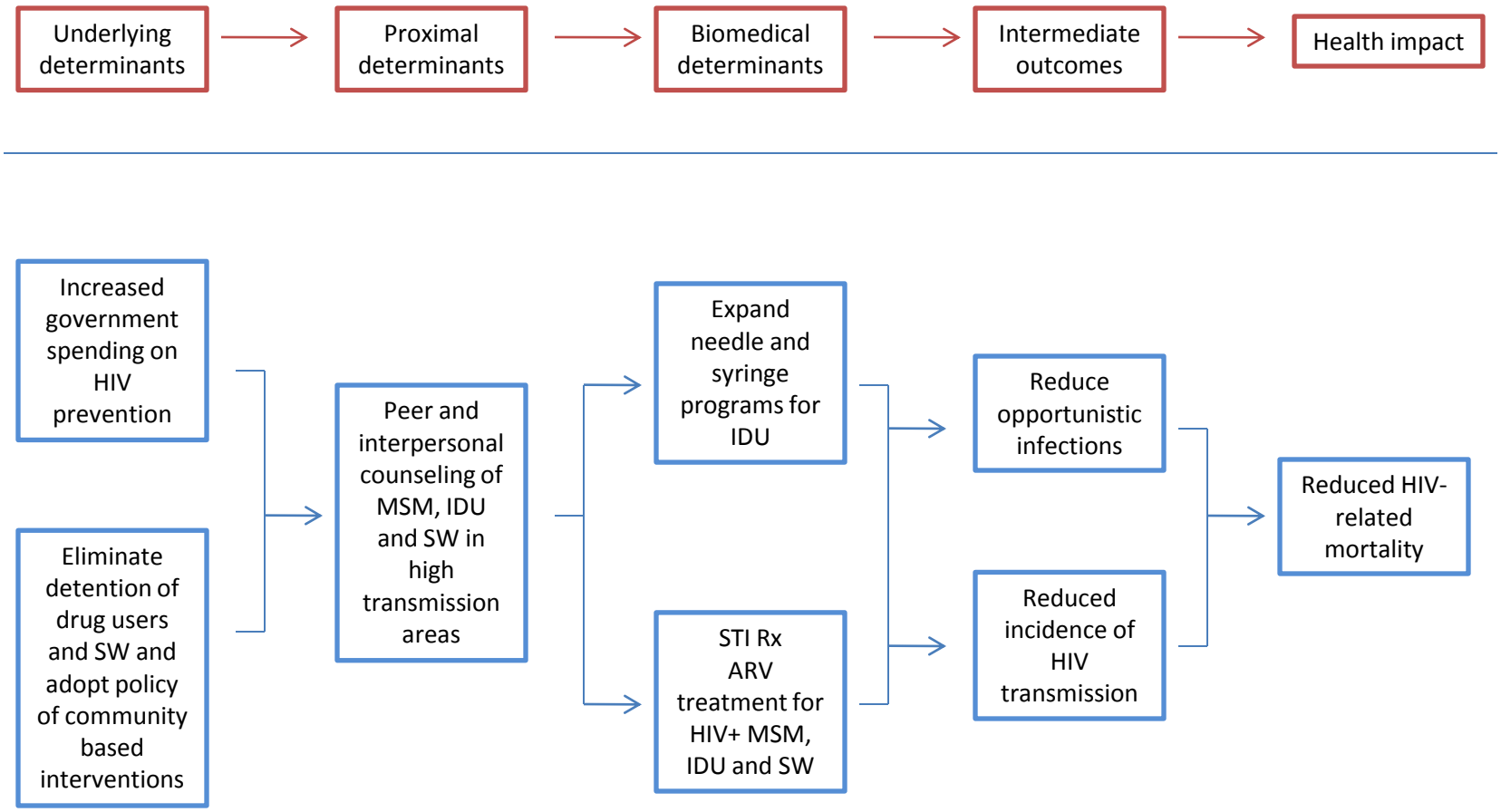
Examples of cost effective interventions along the causal pathway (Vietnam)



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Integrating causal thinking into HSS

Epidemiological causal analysis

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RESULT: A tailored HSS program focused on achieving health outcomes.

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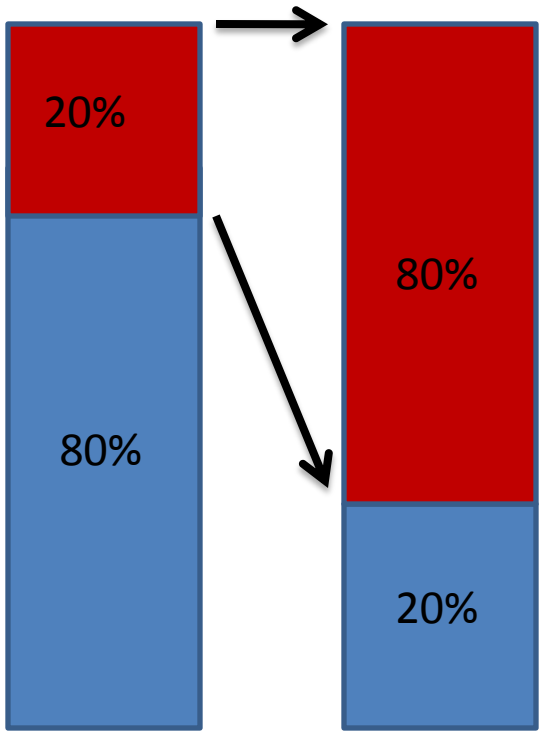

80% of the impact comes from 20% of the interventions

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Results

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Understand the epidemic

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Back-calculation using estimates and projection data – MSM assumption 1

- IDU:
  - low scenario: MOLISA reported number
  - High scenario: reported number applied a multiplier
  - Prevalence: 12 - 56%
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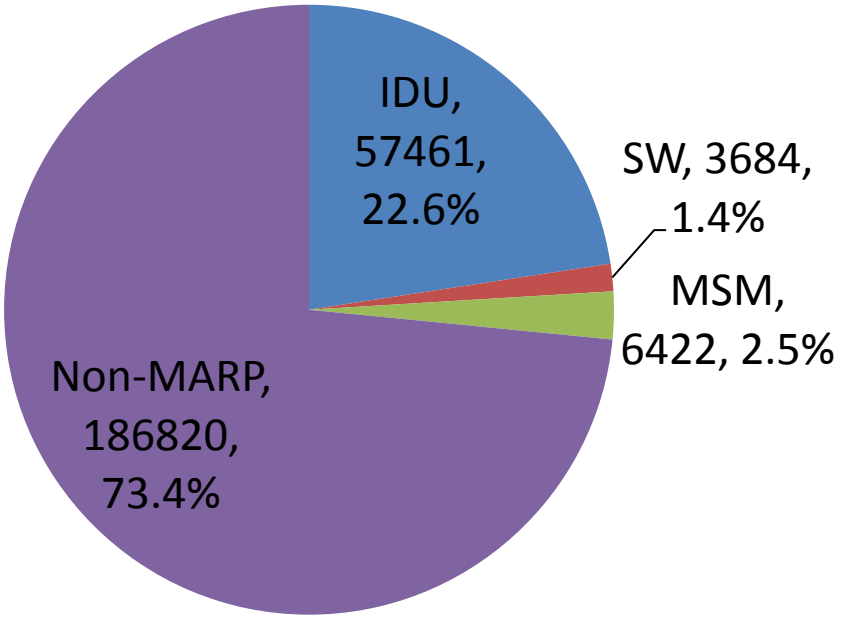

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Back-calculation using estimates and projection data – MSM assumption 2

- MSM:
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  - high: 3% and 1.5%
  - # of gay men practising MSM
    - Big cities: one third
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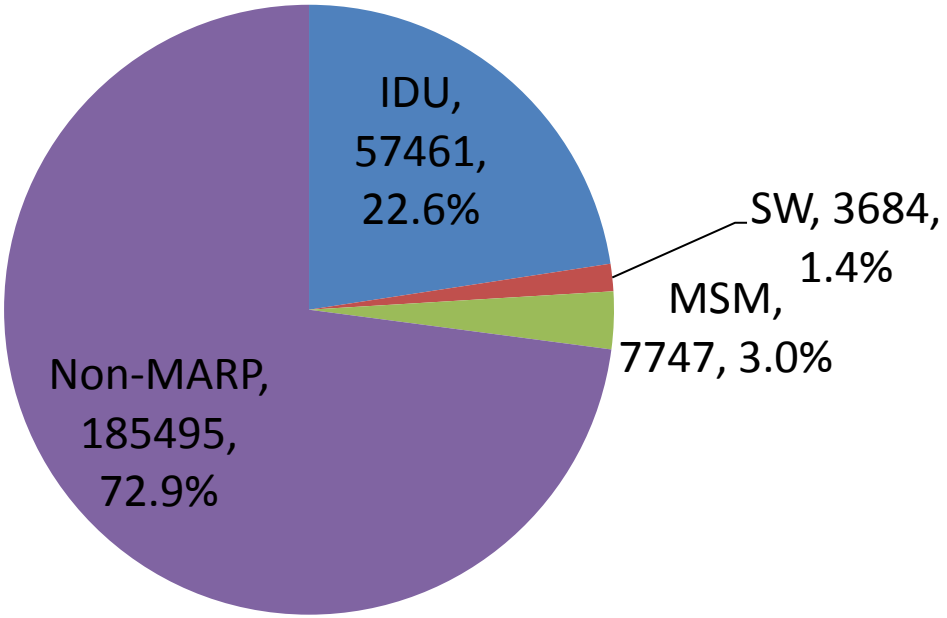

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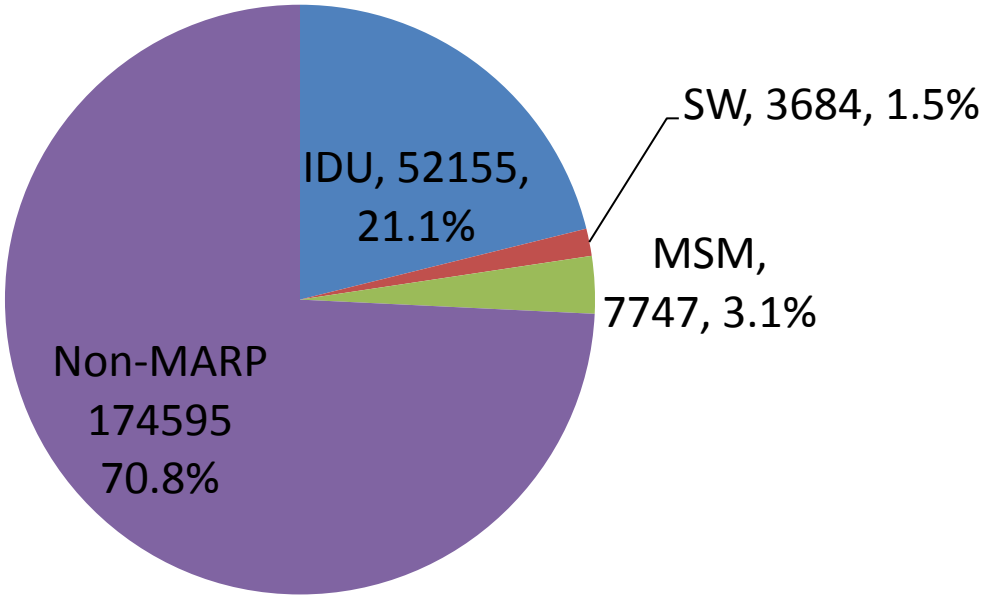
Adjusting IDU population size

- IDU population size for high scenario in Estimate and Projection was on average 2.45 times higher than the registered number of IDUs.
- IDU representatives believe that the official registered number accounts for at least 65% of IDUs in the community. Therefore, we estimate IDU population size to be **registered number/65%** = 171,127 (medium)
- Prevalence among IDU is kept – total infections among IDUs is reduced by 7,623 cases → deduction in total infections to **246,764**

Back-calculation using IDU-adjusted data

Distribution of HIV prevalent cases - 2010
Estimate and Projection data with adjusted IDU number
Total: 246,764



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At risk populations

Primary sexual partner of IDU (Non-IDU/SW)

General men

Non-MARP PLHIV

General women

Male drug users

F. Drug users

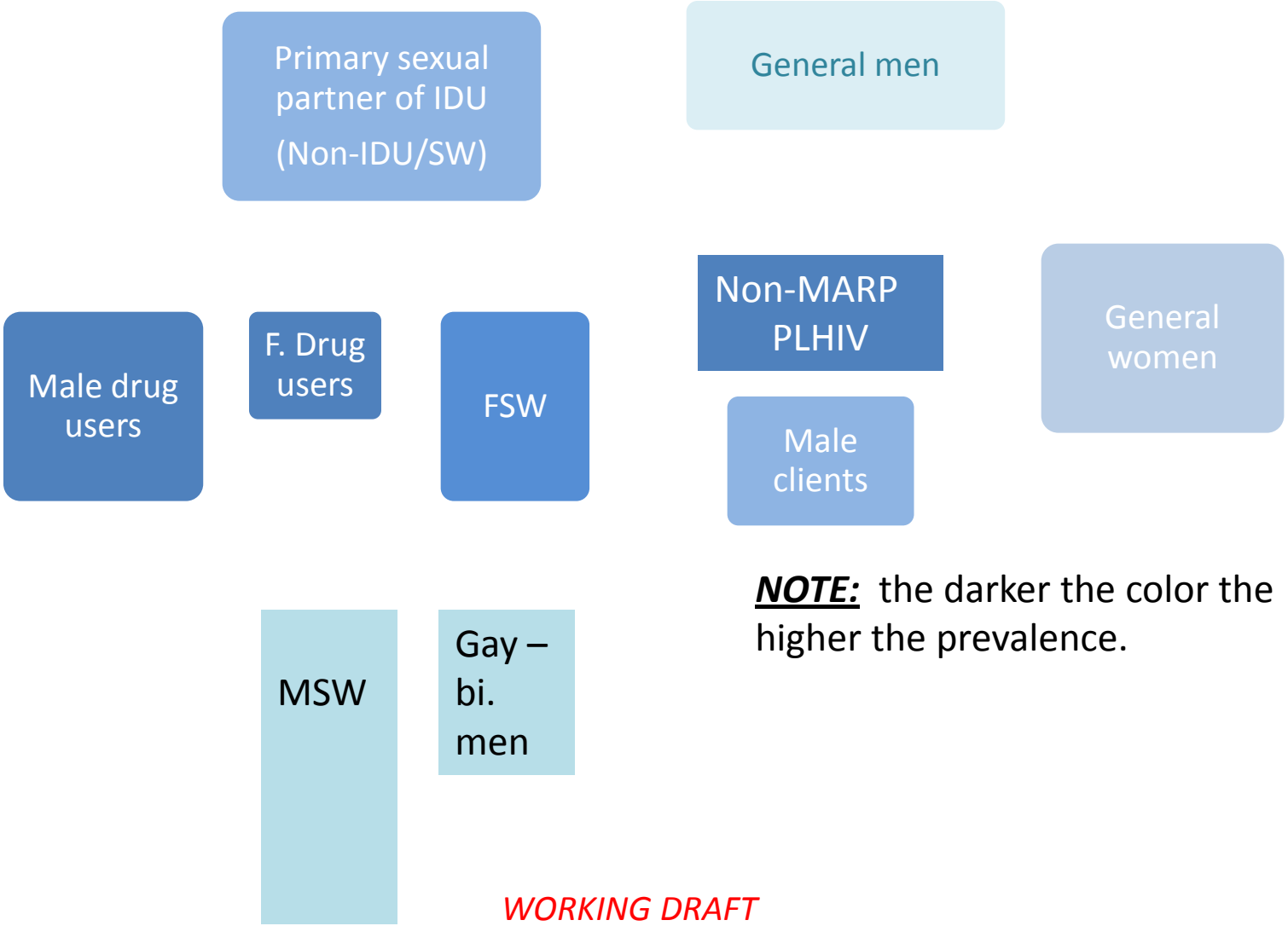
FSW

Male clients

MSM

WORKING DRAFT

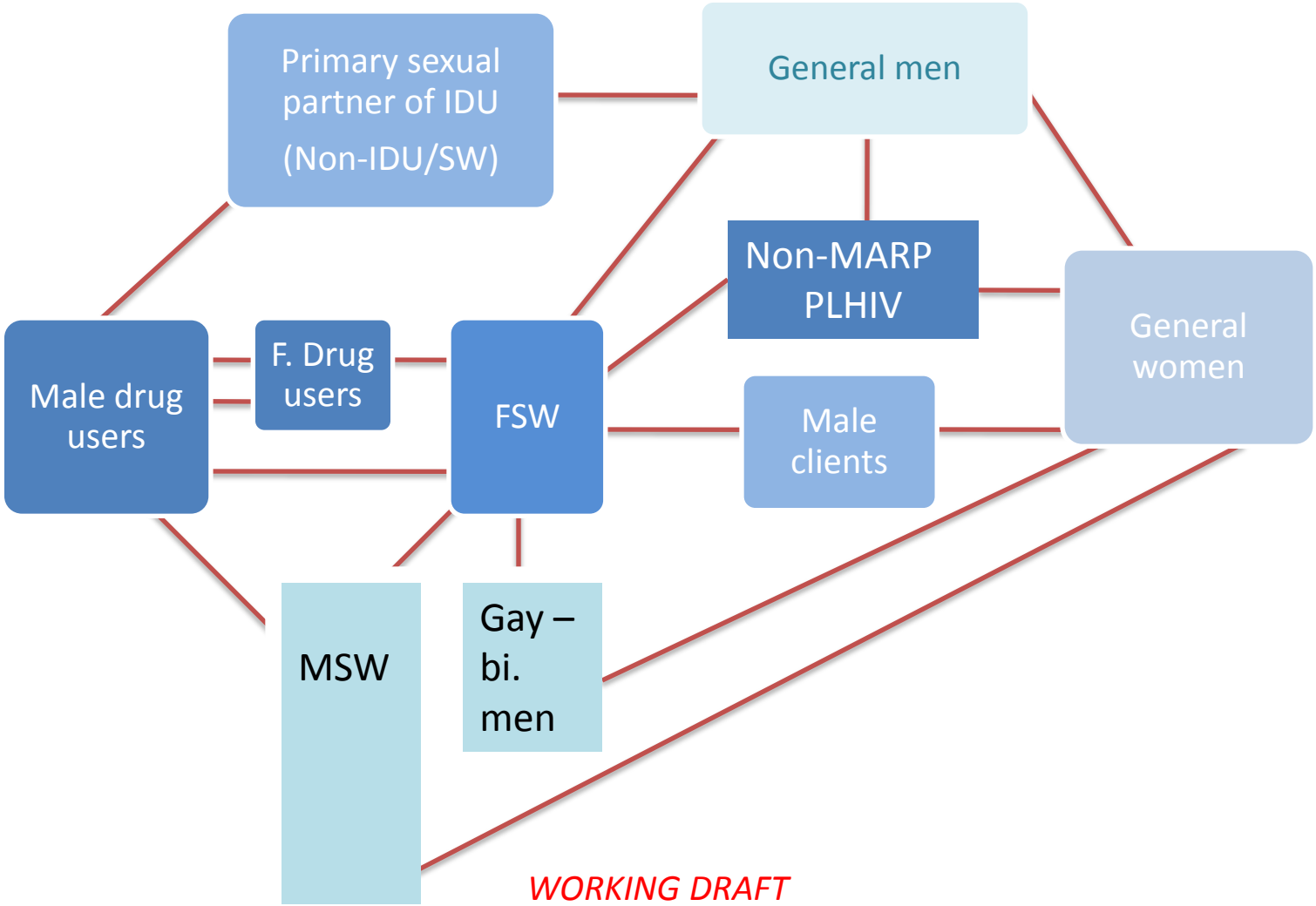
At risk populations by prevalence



NOTE: the darker the color the higher the prevalence.

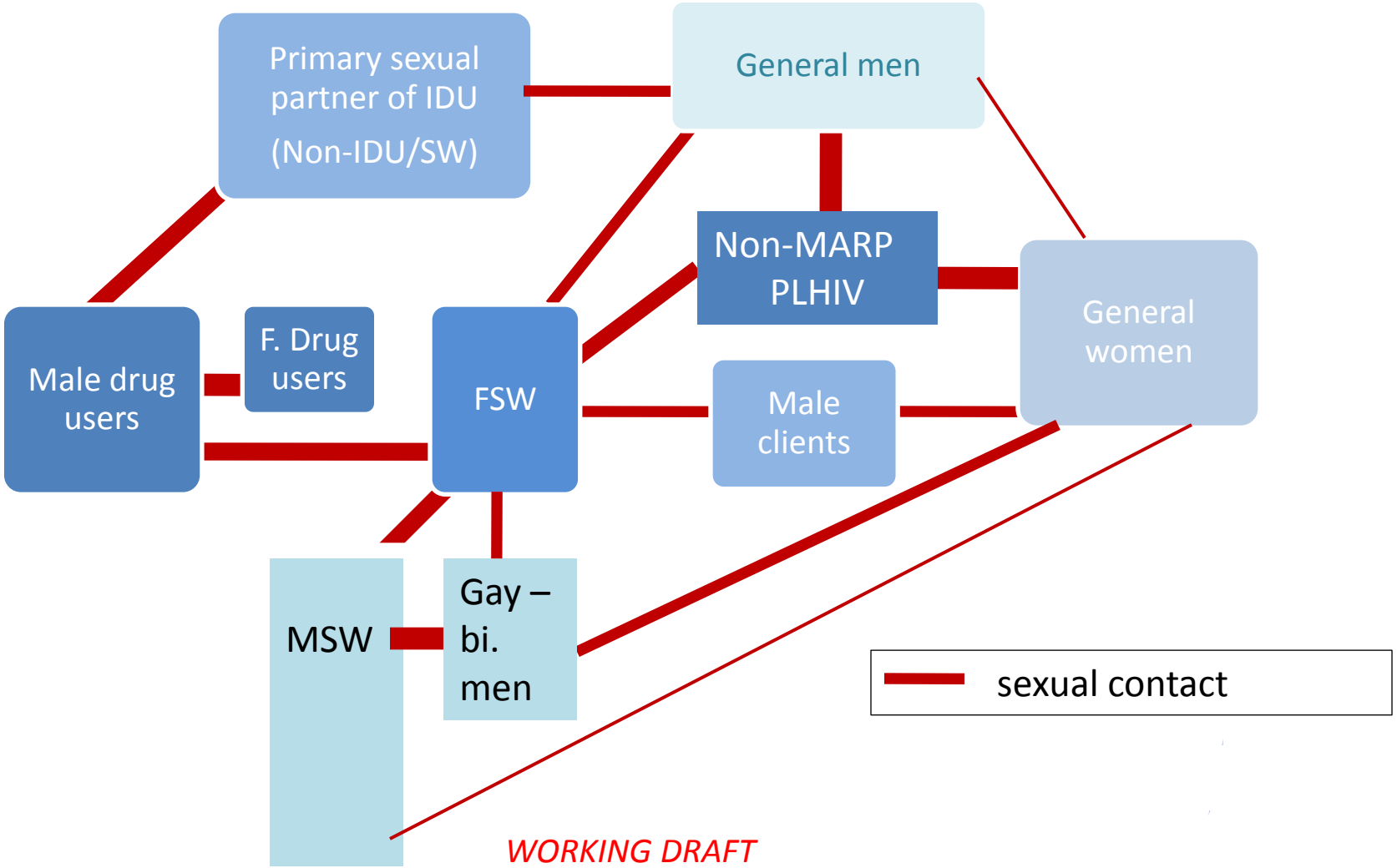
WORKING DRAFT

Interactions among high risk populations

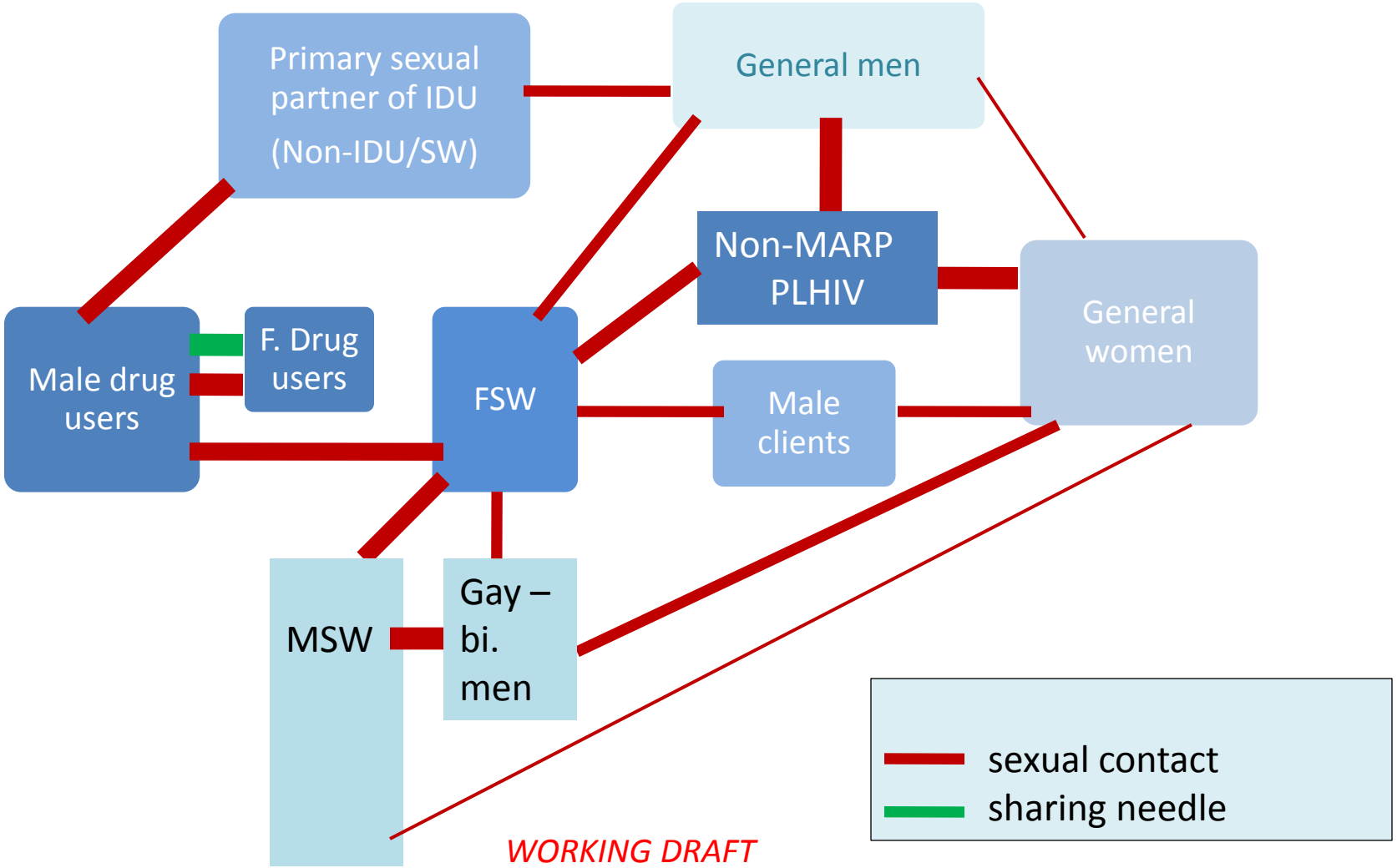


WORKING DRAFT

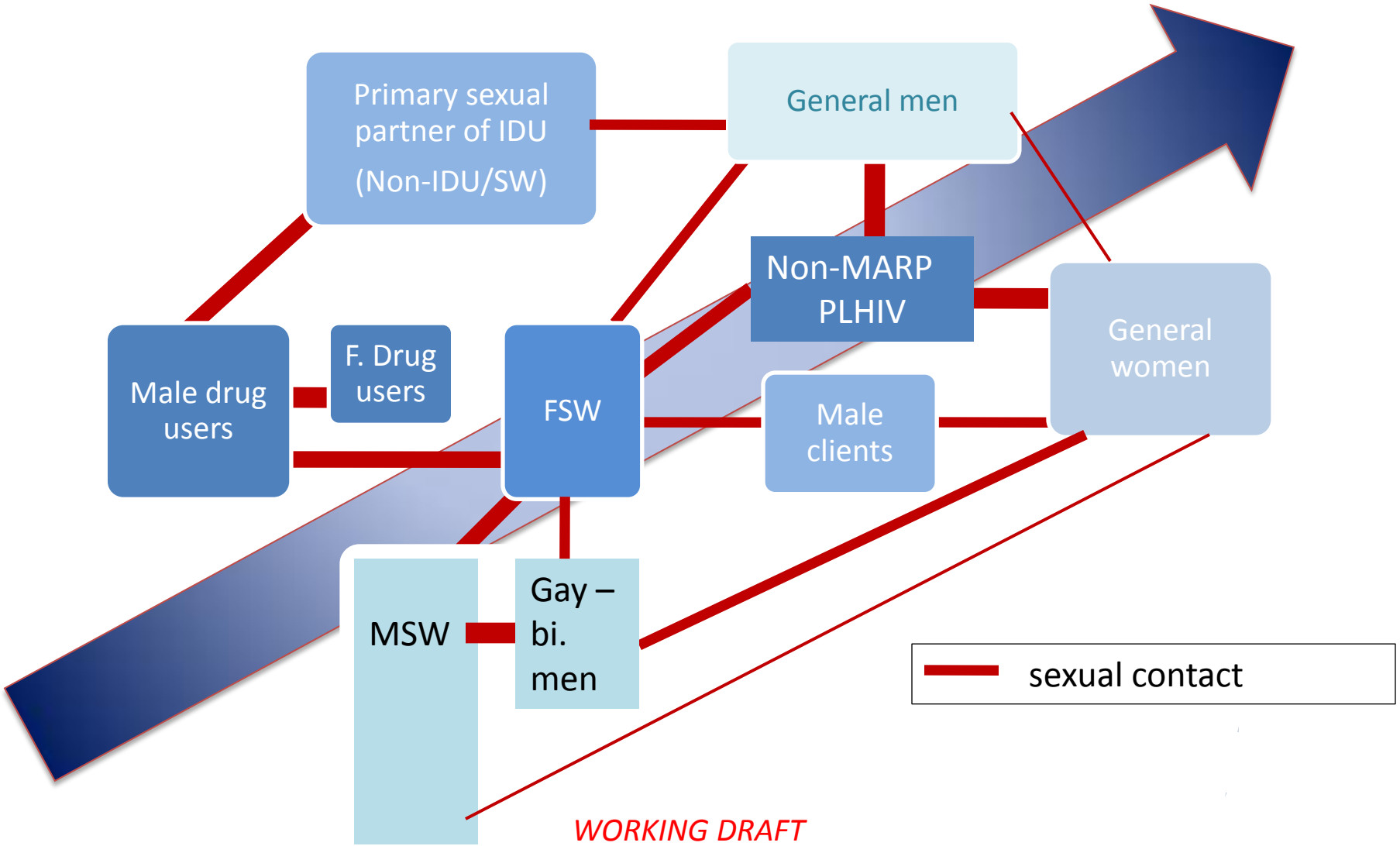
Network of transmission



Method of transmission
Mostly by sexual contact



General direction of transmission



Evidence on transmission network (1)

- IDU sharing needles:
  - Share during last injection: IDU 3% (IBBS), FIDU: 9% in Hanoi, 19% in HCMC (ADRA)
- DU-SW interaction:
  - FIDU sell sex as main income: HN 67% & HCM 34% (ADRA)
  - SSW inject: 1 – 30% (IBBS)
  - SSW has injecting sex partners: regular clients: 1-15%, regular partner: 0-21% (IBBS)
  - MIDU had sex with SW: 2 – 18% (IBBS)
- SW – general men interaction: not all regular partners are drug users (IBBS), 5% & 19% FIDU has non-injecting partners (ADRA).
- FIDU-MIDU interaction: 70 & 73% of FIDU's partners use drug, FIDU share with partner/friend (ADRA)
- PSP risk: IDU reported having sex with PSP past 12 months: 40 – 75% (IBBS), HIV prevalence: 14% (Abt)

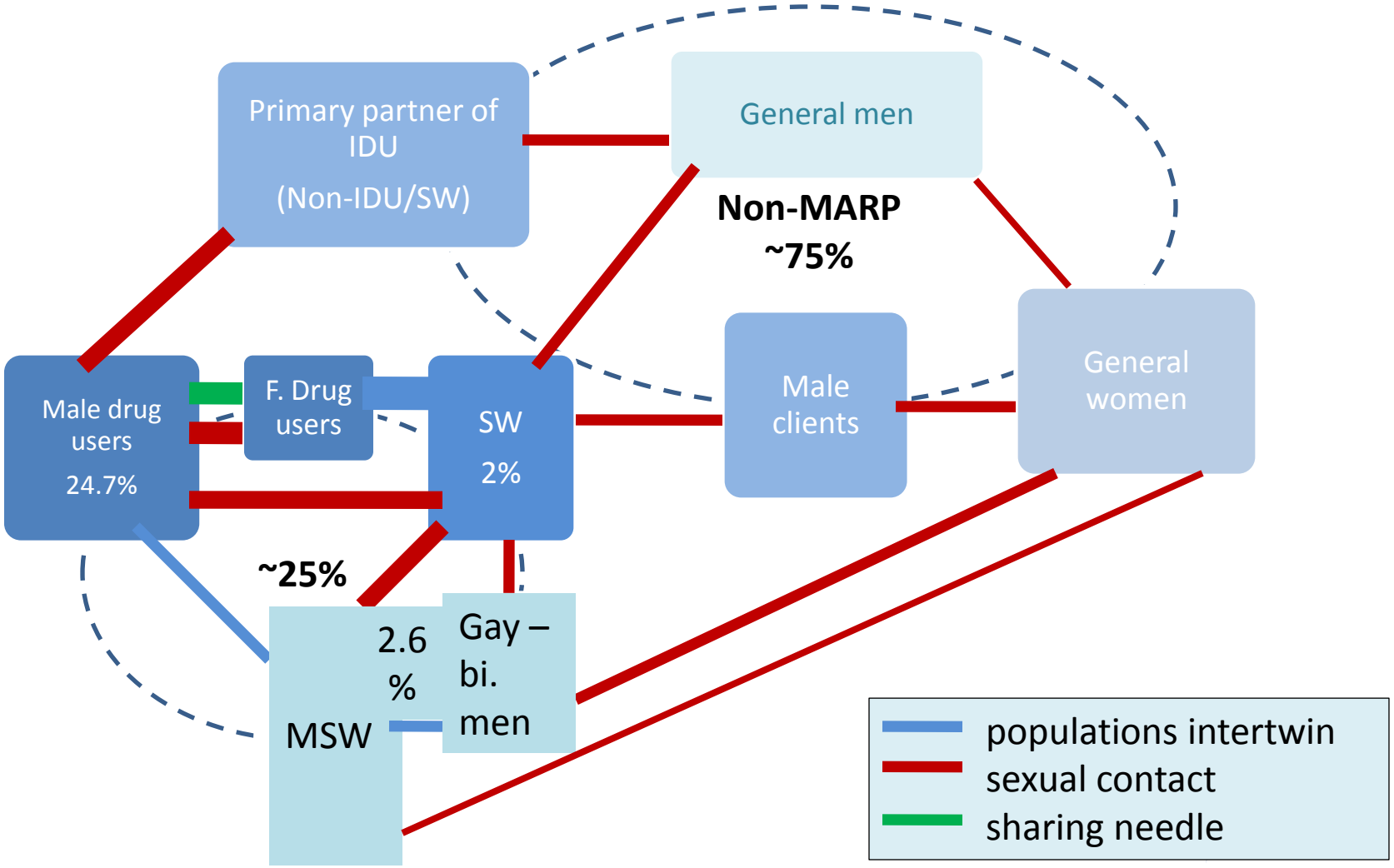
WORKING DRAFT

Evidence on transmission network (2)

- MSM sexual risk: sex wt MSW past month: 3.7 – 7.8%, sex with FSW: 4 – 25% (IBBS)
- MSM – DU interaction: 10 – 32% ever used drug, 1-11% ever injected, partner injected: 3 – 34% (IBBS)
- MSM – general women: sex wt female partner past 12 months: 29 – 49%, sold sex to female client: 0 – 14%, married to a woman: 9 – 19% (IBBS)
- PLHIV transmission risk: 67% male got HIV thru injecting, 88% female for thru heterosexual , 73% of of male and 66% of female have regular partners, 47% & 15% are negative or unknown status , 17% of male and 34% of female did not consistently use condom with negative/unknown-status partner, 25% of MLHIV reported having sex with SW after knowing their status (ISDS/VCSPA)
- PSP – general men: turnover of PSP, annecdotal evidence of PSP have other non-injecting partner who are married or in relationship with other women

WORKING DRAFT

Distribution of current HIV infections



WORKING DRAFT

Prevalent cases
MARPs vs non-MARP men and women

		MARP		Non-MARP	
		#	%	#	%
Male	Prevalent (186,707)	53,362	28.6%	133,345	71.4%
Female	Prevalent (67,680)	8,900	13%	58,780	87%

Men, both MARP and non-MARP, are driving the epidemic.

Prevalent cases are greater among non-MARP women.

WORKING DRAFT

Distribution of new infections

- Using population size, incidence rates to calculate new infections in each population
  - IDU: 5.2% (Vu Minh Quan, 2010)
  - SW: 1% - own estimation using sentinel and IBBS data
  - MSM: 4% (as suggested by IBBS data)
- Total new infections in 2011 = # of PLHIV in 2011 – # of PLHIV in 2010 + # of AIDS deaths in 2011

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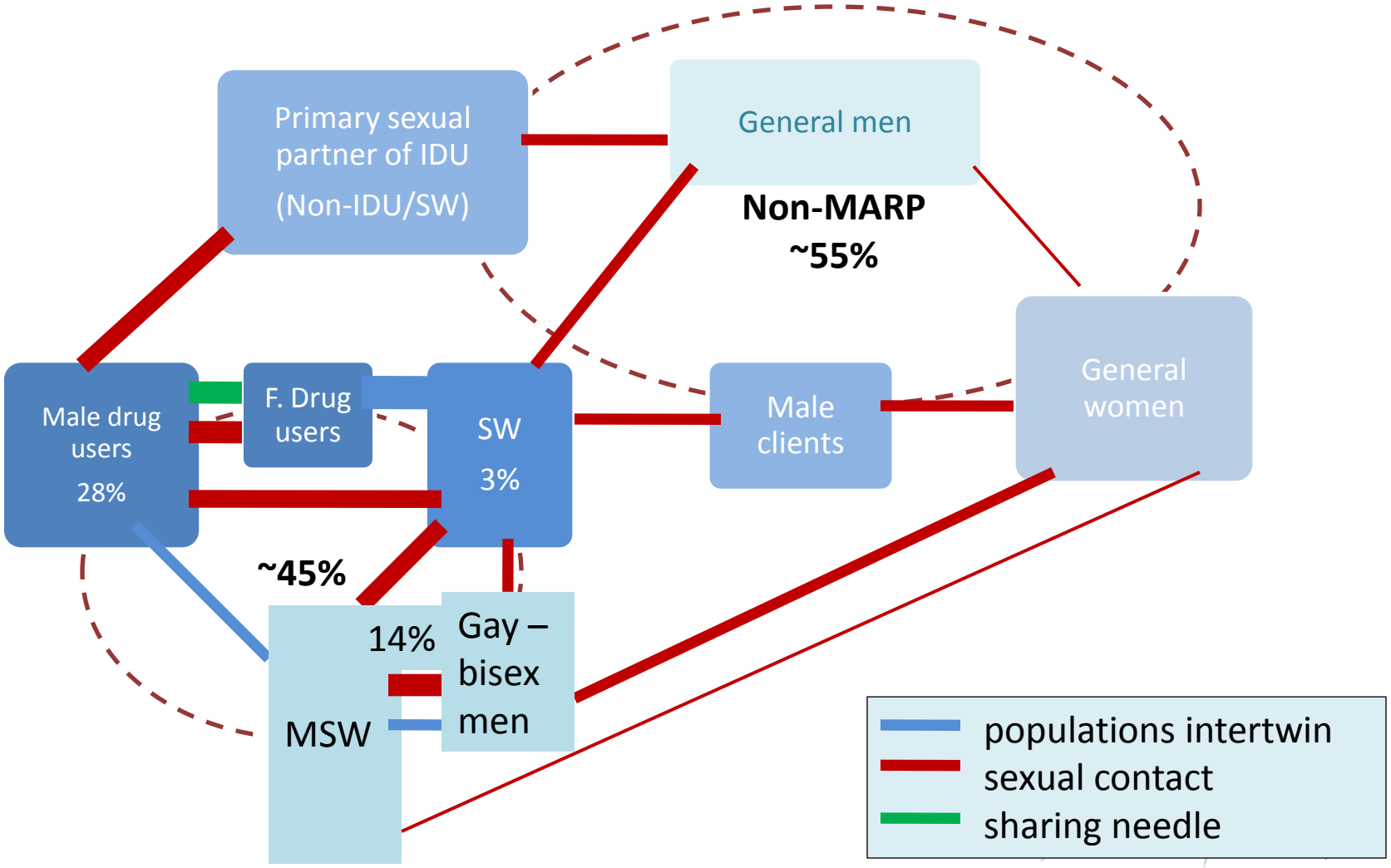
New Infections – total 21,155



WORKING DRAFT

MARPs sub-groups to be targeted

WORKING DRAFT

Risk of being infected vs. reach

High risk

-Venue-based MSW -Undisclosed gay -Unregistered IDU -IDU in closed settings -Call-girl, mobile SW -ATS-using SW, MSM, IDU -Spouses of undisclosed/untreated PLHIV -Spouses of MSM - Long-term non-IDU partners of F/MSW -Regular clients of F/MSW -Clients of injecting SWs -Migrant/mobile workers	-Female IDU -Injecting MSM -Registered IDU -IDU-partner of FSW -Street-based SW -Street-based MSW -Open gay -STD patients seeking treatment in facilities -Spouses of registered IDUs -Spouses of disclosed/untreated PLHIV
- Clients of non-injecting SW	-Spouses of treated PLHIV

Difficult to reach

Easy to reach

Lower risk

WORKING DRAFT

Risk of infecting others vs. reach

High risk

Difficult to reach	Easy to reach
-Positive MSM -Venue-based MSW -Undisclosed gay -Call-girl, mobile SW -Untreated positive SW, IDU -PLHIV who don't know status -Undisclosed/untreated PLHIV -ATS-using M/FSW, MSM, IDU -IDUs in cities implementing zero-tolerant policy -IDU in closed settings -Migrant/mobile workers	-Female IDU -Injecting MSM -Street-based SW -Street-based MSW -Open gay -Registered IDU - STD patients seek treatment in clinics -Spouses of registered IDUs -STD patients seeking treatment in facilities
-Spouses of MSM - Long-term non-IDU partners of F/MSW -Clients of SW	- Spouses of treated PLHIV

Lower risk

WORKING DRAFT

Who are the MARP? Where to find them?

	IDU		SW		MSM	
	Share of IDU+	Share of IDU-	Share of SW+	Share of SW-	Share of MSM	Share of MSM+
North West	21.3%	27%	8.3%	5.2%	8.6%	?
Hai Phong	7.1%	(1.8%)	11.9%	(2.9%)	(2%)	*
Red River delta	11%	12.4%	10.8%	4.6%	12.6%	*
South East				9.5%	8.1%	*
Mekong delta			11.5%	9.8%	15.3%	*
Hanoi	16.6%	13.7%	10.7%	5.2%	7.4%	***
HCMC	24.7%	12.1%	17.4%	35.6%	13.3%	***
Can Tho					1.4%	*
SUM	80.7%	65.1% (66.9%)	70.6%	69.7% (72.6%)	66.7% (68.7%)	

WORKING DRAFT

Summary of epidemiology

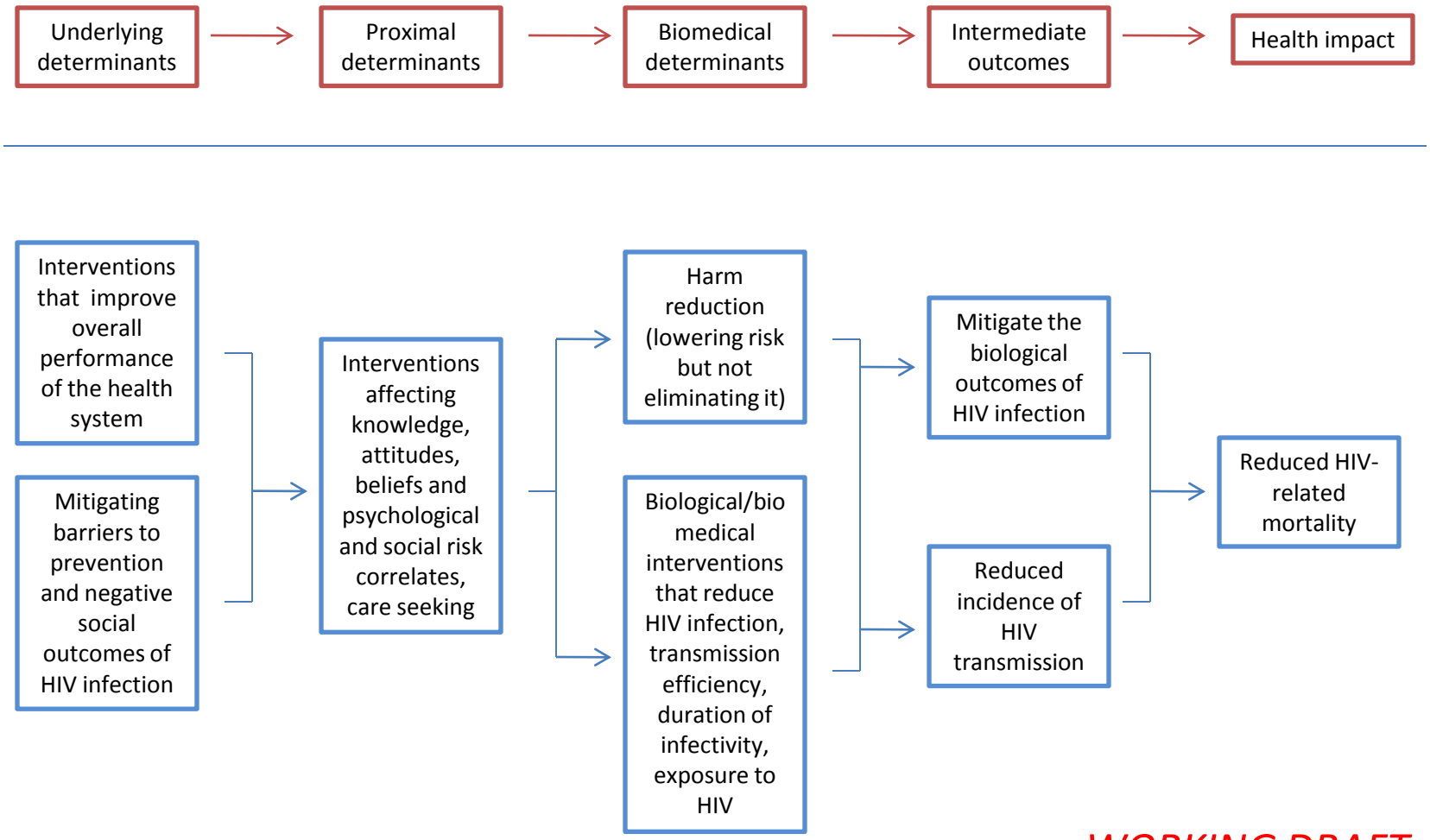
- Male MARP, FIDU and FSW-related new infections = 65% of total new infections
  - Total male MARP-related infections = 39%
    - Male IDU = 25%
    - MSM = 14%
    - Onward infections from male MARP = unknown but significant
  - Total FIDU and FSW-related new infections = 26%
    - FIDU = 3%
    - FSW = 3%
    - Onward infections to clients of FSW = ~ 20%
- New cases cluster in sub populations of MARPS
- New cases cluster geographically
  - Highest number of new cases in Hanoi, Hoh Chi Minh City, Hai Phong
  - A few NW border provinces of Vietnam

WORKING DRAFT

Which interventions to be prioritized?

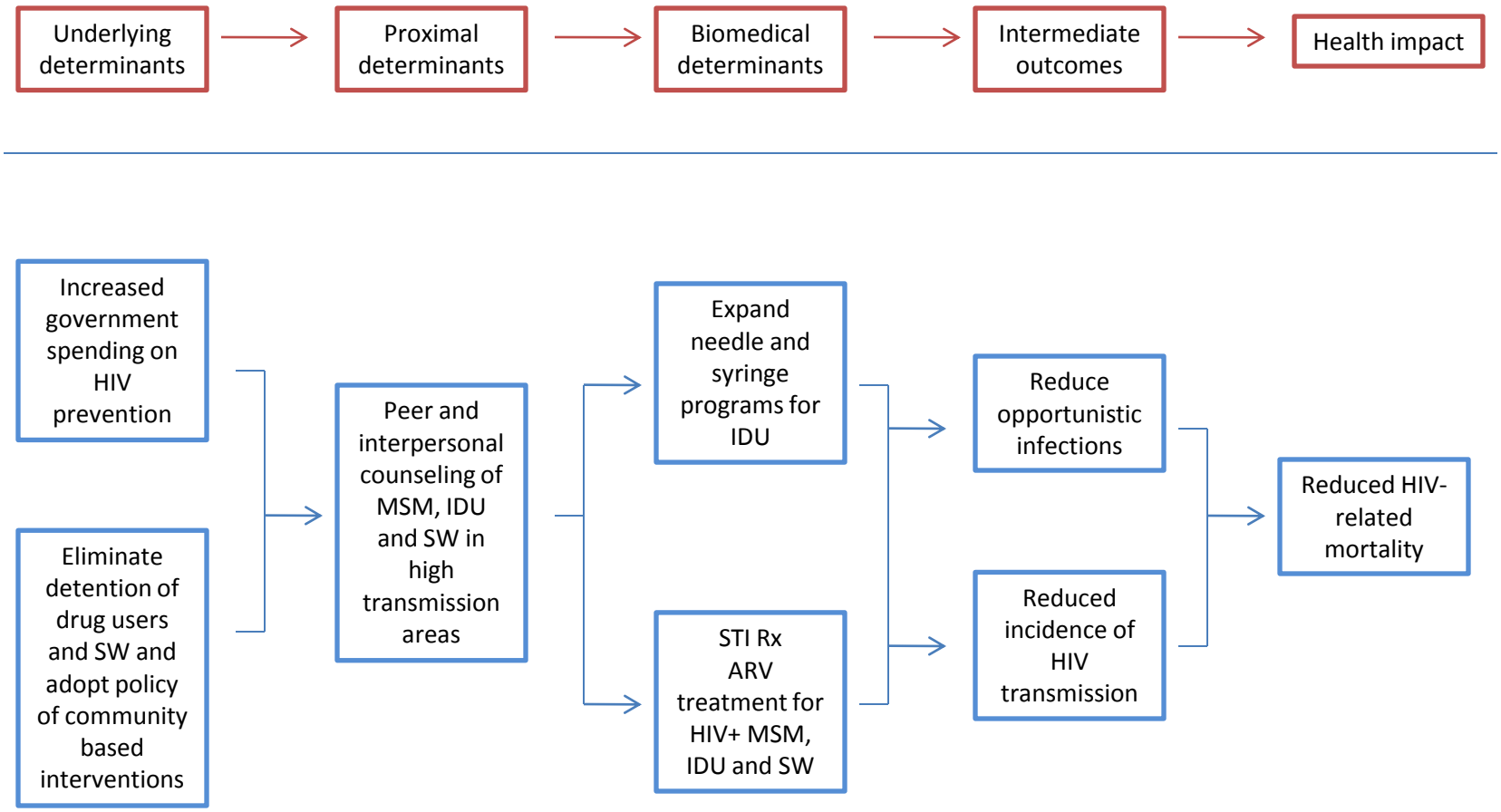
WORKING DRAFT

Interventions can be implemented at specific points along causal pathway



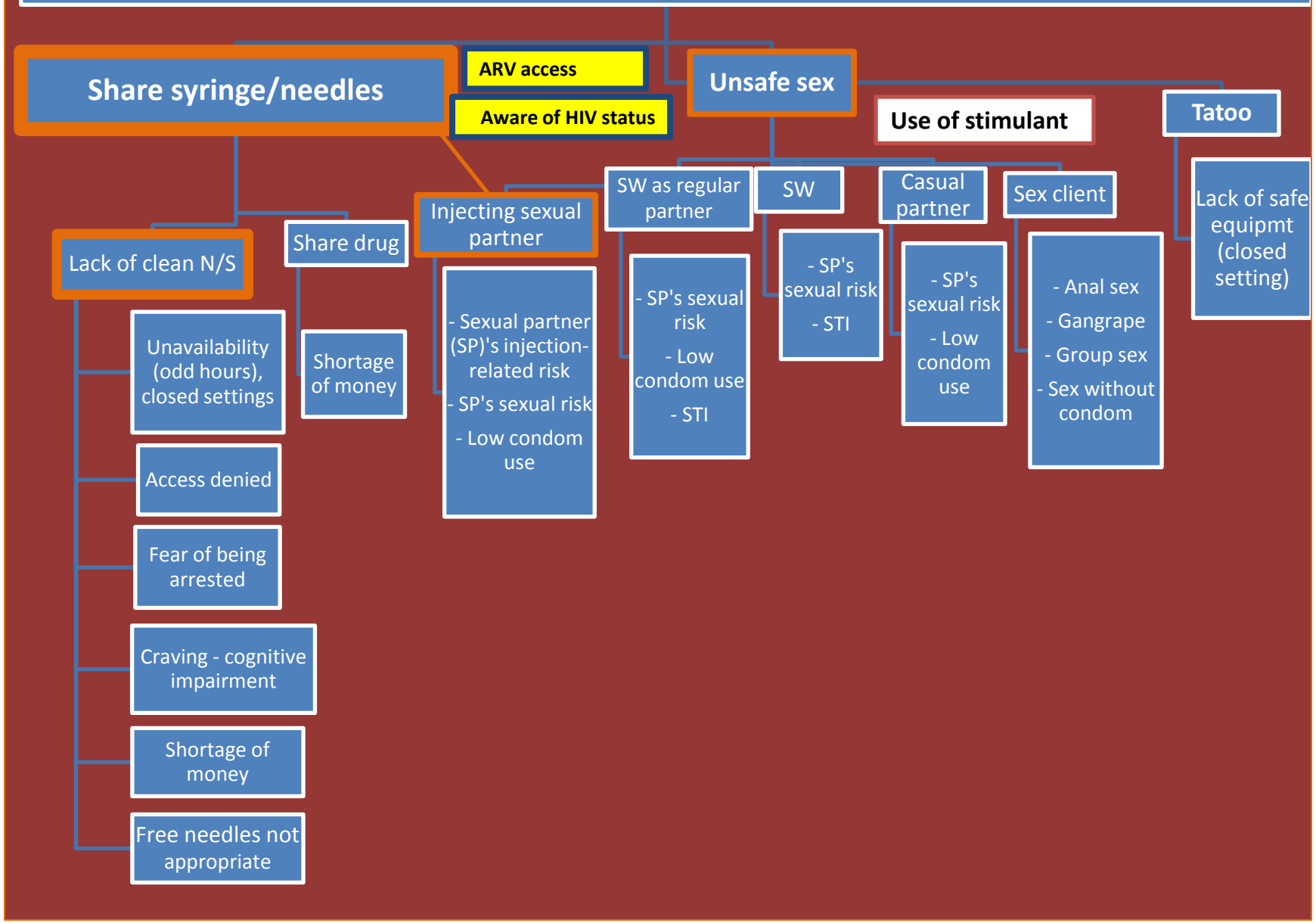
WORKING DRAFT

Examples of cost effective interventions along the causal pathway (Vietnam)



WORKING DRAFT

Interventions can address specific risk factors



WORKING DRAFT

Choosing interventions based on cost effectiveness

Effective on population basis

STI control
Microbicides
Post exposure prophylaxis
Community based peer counseling for IDU
Substitution treatment/methadone
Male circumcision
Traditional theatre
Mass community Rx for STI
HIV treatment as prevention
Condom social marketing

Peer education for SW & IDU
VCT with STI and condoms
Needle and syringe programs
Male condom
Female condom
Screening blood products
Community based education for MSM

High cost **Low cost**

Social marketing on TV & radio
Soap operas
Mass media campaigns
Increased alcohol taxation
School based sex education
Drug enforcement programs
Oversight of private sector providers
Screening sperm donations for HIV

Microfinance
PMTCT
Community based education for low income women
Abstinence campaigns
Be faithful campaigns
Family planning
Disinfecting medical equipment
Disposal of biohazards

Less effective on a population basis

WORKING DRAFT

Needs for data – IBSS analysis

- Characteristics of MARP(+)
- Characteristics of MARP(-)
- Which sub-group(s) of MARP(+) exhibit the highest risk behaviours?
- Which sub-group(s) of MARP(-) exhibit the highest risk behaviours?

WORKING DRAFT

DRAFT for comment
Dan Kraushaar Dec 14, 2010

Review of cost effectiveness of interventions focused on reducing HIV transmission in most at risk populations in Vietnam

NOTE #1: The format and initial data were taken from the following publication. As further publications were reviewed results were incorporated into the chart below. Pattanaphesaj and Teerawattananon *Reviewing the evidence on effectiveness and cost effectiveness of HIV prevention strategies in Thailand* BMC Public Health 2010, 10:401 (http://www.biomedcentral.com/1471-2485/10/401

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NOTE 4: There were few good, independent evaluations upon which to judge effectiveness and few evaluations addressed effectiveness in terms of outcomes (e.g., intervention coverage) and impact (e.g., reduction in incidence of HIV infection).

NOTE 5: Interventions incorporating a biomedical component seem to be more effective not only at improving outputs but also outcomes and impact to the extent that data allow us to make such a conclusion.

Intervention or combination of interventions	FSW	MSW	MSM	FIDU	MIDU	Stable partners[1]
Interventions affecting proximate determinants: Improve knowledge, attitudes, influence psychological and social correlates of risk or that reduce the number of risky contacts which are points of transmission						
Abstinence only programs						
Abstinence plus programs						
Community based education						
General mass media programs[2]						
Condom social marketing						
Street outreach, peer education, interpersonal education/persuasion, interactive dialogue, face to face communication, street outreach						
Routine provider initiated voluntary HIV screening in facilities						
School based sex education (± life skills)[3]						
Voluntary counseling and testing without STI clinic and condom distribution[4]						
Voluntary counseling and testing (VCT) (±STI clinic and condom distribution)[5]						
Workplace based education (±condom dist/free STI clinic)						
Education to promote adherence to universal precautions						
Prevention counseling						
Risk reduction counseling with promotion of condoms						
Youth education and intervention for behavior change						
Interventions affecting biological determinants: Harm reduction interventions which lower the risk of transmission but not eliminate risky behavior[6]						
100% male condom[7]						
Female condom						
Needle and syringe programs allowing for penetration of at risk groups and volume						

[1] Stable partners refers to long term partners of MARPS. This is important since risky practices are highly dependent on the kind of relationship within MARPS groups and between MARPS and other populations as well as the duration of that relationship.

[2] There is disagreement about the effectiveness of mass media depending on the study reviewed. Some studies declare this method effective although costs are of some concern. Other studies suggest that mass media is neither effective nor cost effective.

[3] School based programs were reported as cost ineffective. One article stated that they were effective at reducing the number of sex partners but said nothing about other risk factors or outcomes. Another reference calculated a cost per HIV case averted at between US $6,704 - $9,448 or $376 - $530 per DALY averted)

[4] The evidence of effectiveness of VCT on HIV incidence is ambivalent. In general the impact seems only moderate in terms of reducing unprotected sex and number of sex partners. For this reason VTC along without other interventions has been marked not cost effective. VTC with other services, such as STI treatment and condom distribution seem to be more cost effective.

[5] Three studies reported CE results. One study in Cape Town estimated the cost/HIV infection averted to be US $67 where VTC included STI clinics. A study in Kenya calculated an HIV case averted at US $483. (ref BMC Public Health 2009, 9(Suppl 1): S5)

[6] Various harm reduction programs include more than one intervention. We have separated those interventions for this analysis. A study in Ukraine calculated a package of harm reduction interventions results in a cost per HIV case averted of US $97.

[77] Both the Dominican Republic and Thailand have instituted 100% condom campaigns. In the DR they found a cost per HIV case averted to be US $10,856. The 100% condom campaign resulted in much better CE results. We have left this intervention in this table as very cost effective primarily due to Thailand's experience.

Intervention or combination of interventions	FSW	MSW	MSM	FIDU	MIDU	Stable partners[1]
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Proving safe spaces for vulnerable populations to use preventive services, inject safely.						
Drug substitution treatment (methadone) with counseling and professional services in clinics						
Interventions that affect biological determinants: Biological/biomedical interventions that reduce HIV infection, transmission efficiency, duration of infectivity, exposure to HIV						
HIV vaccine						
STI diagnosis and treatment in clinics[8]						
Mass or community treatment of STI						
Male circumcision[9]						
Microbicides						
ART treatment of sexually active HIV+ populations to reduce onward HIV transmission[10]						
Post exposure prophylaxis						
PMTCT[11]						
Screening blood products and donated organs						
Screen sperm donations for HIV						
Disinfect medical equipment						
Disinfection of tattoo, body piercing and barber equipment						
Use of gloves and protective clothing during medical procedures						
Proper disposal of biohazard waste						
Lubricants for reducing HIV infections during sex between MSM						
Sing nucleic acid test screening of volunteer blood donations						
Interventions that affect underlying determinants: Altering underlying system factors, socio cultural factors including beliefs, traditions, practices and national/local leadership, governance and policies (sometimes referred to as "structural" interventions)						
Increased alcohol tax						
Microfinance						
Microfinance with education						

[8] There seems to be some debate about the effectiveness of treating STIs as a way to prevent incident cases of HIV. A study to reduce STIs in female sex workers in hotels in South Africa calculated a cost per HIV case averted from $1,385 - $3,365. This program included condom distribution, treatment of symptomatic STIs and periodic presumptive treatment. A modeling study in Malawi calculated a cost per HIV case averted in men to b e $15.42. An epidemiological model simulating and HIV epidemic suggested that a cost per HIC averted in the range of US $321- $1,665 was cost effective compared to lifetime HIV treatment costs in generalized epidemics of US $3,500.

[9] Multiple studies have found male circumcision to be cost effective at reducing HIV transmission. It is a one-time procedure which provides some degree of life time protection and is a simple and relatively low cost procedure.

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[11] A generalized CE study reported the cost of preventing maternal to child transmission (MTC) at US $34 per DALY averted in Africa and $310 in Asia. ARVs to avert MTC cost about US $145-280 per DALY averted. Most effective programs combine ART with any of three prevention strategies: improved adherence to therapy, treatment for PMTCT+ and subsidies for ARD in people below poverty. Adding condoms enhanced effectiveness to US $10-$30 per life saved.

Intervention or combination of interventions	FSW	MSW	MSM	FIDU	MIDU	Stable partners[1]
Social change approaches focused on changing norms of entire communities and populations of individuals						
Conditional cash transfers or financial incentives on the demand side[12]						
Conditional cash transfers or financial incentives on the supply side						
Changes in laws, rules and regulations, e.g., governing detention of IDUs in Asia						
Mitigation of barriers to prevention and negative social outcomes of HIV infection						
Training of service providers and law enforcement officers						
Separate accommodation to protect at-risk populations						
Self help and solidarity groups						
Financial and in-kind support						
Medical and legal assistance						
Counseling						
Legal, policy and institutional reform to protect human rights of vulnerable groups and HIV + people						
Categories of interventions that improve overall performance of the health system ("policy control knob")						
Improving financing, risk pooling, source of money, resource allocation	TBD					
Improve organization of services, the roles of public and private providers and ownership						
Alter the regulatory environment						
Change the incentive structure on supply and demand side						
Alter the mechanisms, scale and scope of the delivery of preventive, promotive and curative interventions						

Legend

color	Effectiveness	Cost effective	Description
Dark green	Yes	Yes	The intervention is both effective and cost effective
Light green	Yes	No data	The intervention is effective but no data on cost
Orange	yes	No	The intervention is effective but not cost effective
Red	No	No, No data	The intervention is not effective and no data on cost
white	No data	No data	There is no evidence on effectiveness or cost
Grey	NA	NA	The intervention is not relevant for target or too distal a risk factor to link to HIV transmission

[12] Evidence is building that even small financial incentives can have a dramatic effect on both the supply and demand for services. Because of the magnitude of effect and the fact that CCTs and other demand side interventions have been used for achieving other outcomes, e.g., maternal and child health, we've indicated that this is a cost effective approach. More research, however, is needed to confirm this conclusion in multiple settings.

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[10] ART for prevention has been in the news lately and evidence suggests that it reduces viral load and therefore a person on ART is less likely to infect others. ART also makes a person feel better and therefore more likely to engage in risky practices. The interaction between ART and other preventive interventions needs to be explored. The CE of ART also is sensitive to market prices for ARVs.

[11] A generalized CE study reported the cost of preventing maternal to child transmission (MTC) at US $34 per DALY averted in Africa and $310 in Asia. ARVs to avert MTC cost about US $145-280 per DALY averted. Most effective programs combine ART with any of three prevention strategies: improved adherence to therapy, treatment for PMTCT+ and subsidies for ARD in people below poverty. Adding condoms enhanced effectiveness to US $10-$30 per life saved.

Intervention or combination of interventions	FSW	MSW	MSM	FIDU	MIDU	Stable partners[1]
Social change approaches focused on changing norms of entire communities and populations of individuals						
Conditional cash transfers or financial incentives on the demand side[12]						
Conditional cash transfers or financial incentives on the supply side						
Changes in laws, rules and regulations, e.g., governing detention of IDUs in Asia						
Mitigation of barriers to prevention and negative social outcomes of HIV infection						
Training of service providers and law enforcement officers						
Separate accommodation to protect at-risk populations						
Self help and solidarity groups						
Financial and in-kind support						
Medical and legal assistance						
Counseling						
Legal, policy and institutional reform to protect human rights of vulnerable groups and HIV + people						
Categories of interventions that improve overall performance of the health system ("policy control knob")						
Improving financing, risk pooling, source of money, resource allocation	TBD					
Improve organization of services, the roles of public and private providers and ownership						
Alter the regulatory environment						
Change the incentive structure on supply and demand side						
Alter the mechanisms, scale and scope of the delivery of preventive, promotive and curative interventions						

Legend

color	Effectiveness	Cost effective	Description
Dark green	Yes	Yes	The intervention is both effective and cost effective
Light green	Yes	No data	The intervention is effective but no data on cost
Orange	yes	No	The intervention is effective but not cost effective
Red	No	No, No data	The intervention is not effective and no data on cost
white	No data	No data	There is no evidence on effectiveness or cost
Grey	NA	NA	The intervention is not relevant for target or too distal a risk factor to link to HIV transmission

[12] Evidence is building that even small financial incentives can have a dramatic effect on both the supply and demand for services. Because of the magnitude of effect and the fact that CCTs and other demand side interventions have been used for achieving other outcomes, e.g., maternal and child health, we've indicated that this is a cost effective approach. More research, however, is needed to confirm this conclusion in multiple settings.

Effectiveness of interventions in MARPS

Population	Intervention	Effectiveness	Conditions/discussion	Reference
IDU in US	Methadone maintenance program and street outreach programs			Simulated epidemic in SF and NY in mid 1980s and 1990s, USA J Urban Health. 2003 Sep;80(3):465-81. Preventing HIV in injection drug users: choosing the best mix of interventions for the population

David R. Gibson, PhD, University of California Davis

IDU in US	Methadone maintenance programs	maximizing spending on outreach averted 3.5% of total HIV infections expected and 10 times the 0.3% from maximizing spending on treatment. In late 1980s New York City, the difference is five-fold (2.6% vs. 0.44%, respectively a HIV seroconversion rate of only 3.5% over 18 months among methadone maintenance patients, compared with 22% in a comparison group of out-of-treatment opiate addicts.(11) Even when preexisting differences between MMT clients and nonclients are taken into account,(8,10,12) MMT reduces high-risk practices and the likelihood of seroconversion. Methadone's impact, however, appears to be related principally to its role in reducing injection frequency.(7,9,13) Several studies have shown that methadone treatment increases in effectiveness the longer a patient remains in	risk factors for HIV transmission include shared use of drug injection equipment and unprotected vaginal or anal sex with multiple sexual partners.(2,3) For this reason, interventions that can reduce the prevalence of these practices are critical components of a comprehensive AIDS prevention policy.	HIV Prevention In Injection Drug Users **HIV InSite Knowledge Base Chapter November 1998** **David R. Gibson, PhD, University of California Davis**

		the treatment program. Effectiveness, however, appears to be widely variable, depending both on the characteristics of patient populations and the array of ancillary services available to patients "low threshold" methadone had little impact on injection behavior.(14,15) "Low-threshold" refers to the practice of not requiring patients to attend a clinic regularly or remain abstinent from injection drugs		
IDU	Needle exchange programs	A 1993 review of needle exchange programs in the United States and abroad,(17) commissioned by the Centers for Disease Control and Prevention, found that of 14 acceptably executed studies, 10 found attendance at a needle exchange to be associated with reduced syringe sharing, and four found no such association. Four additional studies that examined the impact of exchange programs on high-risk sexual behaviors found no clear evidence of beneficial or adverse effect. Coverage of needles has been intermittent in with aggressive programs. impact is a function of penetration (the proportion of IDU who exchange) and volume (the number of needles exchanged). The effectiveness of needle exchange can be maximized by increasing both its penetration and volume. Penetration is important independent of volume because the greatest benefit in decreased sharing comes with the first needle each client receives, because this event has	Detailed ethnographic mapping of the IDU community may be helpful in identifying sites and times that make it convenient for the majority of IDU to attend. It may also be helpful to staff the exchange with recovering IDU drawn from the communities they serve. Recovering IDU have ethnographic knowledge of the IDU community, and are more likely to be viewed as peers or role models of behavioral change	HIV Prevention In Injection Drug Users **HIV InSite Knowledge Base Chapter November 1998** **David R. Gibson, PhD, University of California Davis**

		the greatest impact on syringe circulation time; additional exchanges have decreasing marginal value. Volume depends in part on penetration and is important because each additional exchange further decreases the circulation time of used syringes, decreasing the likelihood that an infected syringe will be used		
Street outreach		brief (typically 10 minutes) educational encounters between outreach workers and drug injectors during which basic information about transmission of HIV was conveyed, and condoms and bleach were distributed found dramatic decreases in HIV risk behavior among outreach clients.(27) For example, the proportion of clients judged to be at high risk of infection with HIV fell from 62% prior to receiving outreach to 31% at a 6-month follow-up interview, and similar decreases (16 to 8%) were noted in the proportion of clients judged to be at high sexual risk	Outreach may owe much of its effectiveness to the fact that it is usually conducted by peer educators who are recovering drug users known to the drug user community	HIV Prevention In Injection Drug Users **HIV InSite Knowledge Base Chapter November 1998** **David R. Gibson, PhD, University of California Davis**
IDU	Counseling and testing	Little conclusive evidence exists that counseling and testing is an effective approach to reducing high-risk behavior in IDU.		
IDU	Methadone maintenance to reduce needle sharing	The odds of respondents in methadone maintenance being in the higher risk group were half those of daily heroin users not in treatment for all three transitions in a four-level ordinal scale of risk (OR 0.55, 95% CL 0.33 to 0.90, ordinal logistic regression)	methadone maintenance reduces heroin addicts' risk of infection with HIV by reducing the likelihood of their injecting drugs rather than by changing their injecting behavior	Caplehorn JR, Ross MW. Methadone maintenance and the likelihood of risky needle-sharing. Int J Addict. 1995 May;30(6):685-98 [PubMed ID: 7657397]
IDU	Methadone treatment			Klee H, Faugier J, Hayes C, Morris J. The sharing of injecting

				equipment among drug users attending prescribing clinics and those using needle-exchanges. Br J Addict. 1991 Feb;86(2):217-23 [PubMed ID: 2021704]
IDU MSM CSW	Condoms	The correct and consistent use of male condoms reduces the risk of sexual transmission of HIV by 80% to 90%. Evidence indicates that female condoms may offer similar levels of protection against HIV infection.		Klee H, Faugier J, Hayes C, Morris J. The sharing of injecting equipment among drug users attending prescribing clinics and those using needle-exchanges. Br J Addict. 1991 Feb;86(2):217-23 [PubMed ID: 2021704]
MSM	Male circumcision	Randomized trials **in areas of high HIV prevalence** have demonstrated that male circumcision reduces the risk of heterosexually acquired HIV *in men* by approximately 60%. This evidence supports the findings of many observational studies. There is no definitive evidence that male circumcision reduces the risk of HIV transmission from men to women, or between men who have sex with men.		Klee H, Faugier J, Hayes C, Morris J. The sharing of injecting equipment among drug users attending prescribing clinics and those using needle-exchanges. Br J Addict. 1991 Feb;86(2):217-23 [PubMed ID: 2021704]
IDU	Methadone	daily dose remained protective with a linear effect noted even at low doses and time out of treatment was the most important risk factor. The risk increased 1.5 times for every 3 months spent out of treatment.	Long-term methadone treatment protects against HIV infection. Its effect may be attributable to a reduction in the frequency of injecting drug use or to an increased knowledge of risk factors following counselling in drug centres	Serpelloni G, Carrieri MP, Rezza G, Morganti S, Gomma M, Binkin N. Methadone treatment as a determinant of HIV risk reduction among injecting drug users: a nested case-control

				study. AIDS Care. 1994 6(2):215-20 [PubMed ID: 8061081]
IDU	Needle exchange			Buning EC. Effects of Amsterdam needle and syringe exchange. Int J Addict. 1991 Dec;26(12):1303-11 [PubMed ID: 1787023]
MSM IDU CSW	Counseling and testing	All longitudinal studies of homosexual men reported reductions in risky behavior among both tested and untested men, and a few reported greater decreases among seropositive men than among seronegative men and those untested or unaware of their serostatus. For intravenous drug users in treatment, we found reductions in intravenous drug use and sexual risk behaviors regardless of counseling and testing experience. We noted substantial risk reduction among heterosexual couples with one infected partner.	Meta analysis	Higgins DL, Galavotti C, O'Reilly KR, Schnell DJ, Moore M, Rugg DL, Johnson R. Evidence for the effects of HIV antibody counseling and testing on risk behaviors. JAMA. 1991 Nov;266(17):2419-29 [PubMed ID: 1920748]
MSM IDU CSW	AIDS education	Immediately after the interventions, enhanced group members reported significantly greater self-efficacy to talk themselves out of AIDS-risky behavior; other knowledge and attitude scales did not differ by intervention. At follow-up, significant reductions in risky drug use were reported by all groups. Enhanced group members reported significantly greater reduction in injection frequency than did late informational subjects. CONCLUSIONS. No beneficial effect was detected of delaying AIDS education for clients entering detoxification. At this early stage of follow-up, there is only weak evidence that an enhanced intervention improved outcomes		McCusker J, Stoddard AM, Zapka JG, Morrison CS, Zorn M, Lewis BF. AIDS education for drug abusers: evaluation of short-term effectiveness. Am J Public Health. 1992 Apr;82(4):533-40 [PubMed ID: 1546770]
MSM	Counseling	Compliance with interventions was good.		Baker A, Heather N,

IDU CSW	and motivation	Correspondence of self-reports with urinalysis and collateral reports was satisfactory. There were no significant differences between groups in risk-taking behaviours during the month before follow-up. However, there was evidence of a lower rate of needle-risk behaviour (sharing and cleaning) during the heaviest risk-taking month since pre-intervention assessment in the group given RP. There were no indications that BI was of greater benefit than the usual methadone treatment and neither intervention appeared to reduce sexual risk behaviour.		Wodak A, Dixon J, Holt P. Evaluation of a cognitive-behavioural intervention for HIV prevention among injecting drug users. AIDS. 1993 Feb;7(2):247-56 [PubMed ID: 8466688]
IDU	Skills building			el-Bassel N, Schilling RF. 15-month followup of women methadone patients taught skills to reduce heterosexual HIV transmission. Public Health Rep. 1992 Sep-Oct;107(5):500-4 [PubMed ID: 1410230]
MSM	out-reach, small groups, and a publicity campaign	Following intervention, the proportion of men engaging in any unprotected anal intercourse decreased from 41.0% to 30.0% (-27% from baseline), decreased from 20.2% to 11.1% (-45% from baseline) with nonprimary partners, and decreased from 58.9% to 44.7% (-24% from baseline) with boyfriends	To reach risk-taking young gay men, HIV prevention activities must be embedded in social activities and community	Kegeles SM, Hays RB, Coates TJ. The Mpowerment Project: a community-level HIV prevention intervention for young gay men. Am J Public Health. 1996 Aug;86(8):1129-36 [PubMed ID: 8712273]
IDU				**Preventing HIV in injection drug users: Choosing the best mix of interventions for the**

				population Amy R. Wilson and James G. Kahn

Best evidence on strategies to reduce HIV transmission

Dk 12-6-10 Hanoi, Vietnam

Target group	Method	Sub method	Mechanism	Evidence	Issues
IDU:	Source: ***Preventing HIV Infection among IDUs in high risk countries: An assessment fo the Evidence*** Committee on the prevention of HIV infection among injecting drug users in high risk countries. ISBN: 978-0-309-10280-3, 298 pages, 2006				
Question: What impact do intervention programs have on the extent and frequency of drug injection?					
	Treating drug dependence	Pharmacological			
		Opioid agonist -	Prevents withdrawal symptoms, creating cross-tolerance to effects of opiates, reduce opiate cravings and therefore need for use of illicit drugs	Strong evidence that methadone and buprenorphine aer effective in treating dependence on opioids.	Drugs can be diverted to illicit market. Does not reduce unsafe sec or co occurring use of other drugs.
		Opioid antagonist	Reduces the euphoric effects of opiates	Naltrexone. Evidence is limited and attrition is high.	Drop outs common. Must be detoxified before starting.
		Psychosocial		no psychosocial intervention alone—without additional pharmacotherapy—has been shown to be efficacious in treating opioid dependence	
		Psychosocial	Contingency management: vouchers or direct financial payment for	Good evidence of longer abstinence and longer retention on treatment Strong evidence for contingency management	Also shown to reduce meth use.

Target group	Method	Sub method	Mechanism	Evidence	Issues
			remaining abstinent or other factors and withholding reward for those who do not.		
		Psychosocial	Phsychotherepeutic approaches: drug counsening, drug counseling, cognitive behavioral therapy and community reinforcement approach.	Modest evidence. Weak evidence on effectiveness of therapeutic communities, chemical dependency programs, drug anonymous treatments.	
	Reduce risk of transmission through dirty needles and syringes	Providing clean needles and syringes		Good evidence that NSE programs in a multi-compoenent program is associated with reduction in drdug relatd HIV risk behavior including hsaring of needles and syringes and unsafe injection and disposal practices and frequency of injection.	Potential for unintended consequences, e.g., injecting becomes safe and more users. Studies have not found such outcomes. Can link drug users to other programs. Helps prevent Hep C Questions remain about impact of multi-component programs that include needle and syringe access on reduction in incidence.
		Sterilization programs using bleach and cleaning equipment	Kills HIV virus	Weak evidence.	Poor compliance with protocols. Bleach not available everywhere. Not available at right time.
		Alternative access to needles and syringes. Enhance legal	Eliminates criminal penalties for possessing needles and syringes.	Few studies examined impact on drug related HIV risk behavior. Suggestive evidence of a reduction. Evidence regarding supervised injecting facilities and vending	

Target group	Method	Sub method	Mechanism	Evidence	Issues
		access through pharmacy sales, voucher schemes, physician prescription programs.		machjines, while encouraging, is insufficient for deawing conclusions on their effectiveness in reducing drug related HIV risk among IDU	
	Outreach and education	Effective in linking hard-to-reach injecting drug users with drug treatment and other health and social services. The impact of outreach on sex-related HIV risk behavior is less clear.	reduce drug-related risk behavior, including injection frequency and sharing of injection equipment.	review by Coyle et al. (1998) included studies that consistently reported that after an outreach intervention, significant declines occurred in self-reported injection drug use (10 of 11 studies), injection frequency (17 of 18 studies), reuse of needles and syringes (16 of 20 studies), and reuse of other equipment such as cookers, cotton, and rinse water (8 of 12 studies). A later review article by Needle and colleagues (2005) updated the 1998 review and confirmed findings that outreach results in self-reported reduction in HIV-related risk behavior.	
	Overcoming barriers to reducing HIV risk	Individual			
		Structural/ Environmental Legal/criminal justice	Reduces tension between criminal justice and PH approaches		Need to carefully determine how to use scarce resources. Sustainability of programs critical.

Target group	Method	Sub method	Mechanism	Evidence	Issues
			Reduces social stigma and discrimination		
			Improve PH infrastructure, staff and expand programs.		Need to monitor and evaluate their programs to ensure effectiveness
Question 2: What evidence is there on the extent to which these prevention strategies help reduce HIV transmission from IDUs to their sex partners, and through maternal-to-child transmission to their offspring?					
IDU	Reduce sexual transmission	Drug treatment		Evidence of drug treatment reducing sexual transmission is weak and inconclusive. Some studies suggest that methadone maintenance therapy is associated with small reductions—compared with pretreatment baseline measures—in the number of sexual partners and exchanges of sex for money or drugs, but that it has virtually no effect on reported rates of unprotected sex	Efforts should be made to combine effective programs that address sex-related HIV risk behavior with drug treatment programs.
		Sterile needle and syringe programs		Evidence of drug treatment reducing sexual transmission is weak and inconclusive.	Few studies have evaluated the effect of NSEs on sex-related HIV risk behavior. This issue has not been well studied, and the existing evidence is insufficient to determine the effectiveness of NSE in reducing sex-related risk. Sterile needle and syringe access programs should focus additional efforts on

Target group	Method	Sub method	Mechanism	Evidence	Issues
					reducing sex-related HIV risk behavior
		outreach		There is limited evidence that outreach influences self-reported sex related risk.	
Question 3: How effective are drug treatment programs, sterile needle and syringe access programs, and outreach in reducing HIV transmission among IDUs?					
	Drug treatment: pharmaco therapies	Continuous opioid agonist maintenance treatment	Protection against HIV sero conversion	Evidence from prospective cohort and case-control studies shows that continuous opioid agonist maintenance treatment is associated with protection against HIV sero conversion. Risk of HIV sero conversion is inversely related to the length of time in treatment.	
	Psychosocial			No studies have examined the impact of individual (i.e., not in conjunction with opioid agonist maintenance treatment) psychosocial interventions for substance abuse treatment on HIV incidence	
	Sterile needle and syringe access programs	Multi component programs that include needle and syringe exchange		Multi component programs did reduce drug-related HIV risk behavior but questions remain about impact on HIV incidence. While evidence shows that multi-component prevention programs are associated with reductions in drug-related HIV risk behavior, questions remain about the specific contribution of individual elements to reductions	Evaluation studies of such multi-component HIV prevention programs have primarily examined their impact on HIV risk behavior rather than HIV incidence. While such studies consistently show that these programs reduce drug-related HIV risk behavior (see the response to

Target group	Method	Sub method	Mechanism	Evidence	Issues
				in risk behavior and HIV incidence.	Question 1), questions remain about their impact on HIV incidence (Bruneau et al., 1997; Strathdee et al., 1997; Schechter et al., 1999; Patrick et al., 1997). Committee identified five studies that found that multi-component HIV prevention programs that include NSE have significantly less impact on transmission and acquisition of hepatitis C virus than on HIV. Further research is needed to identify the most effective and cost-effective combination of programs that are feasible to implement in high-risk countries.
		Disinfection programs		field studies show that, in practice, drug users do not correctly follow disinfection procedures, and that they fail to disinfect syringes effectively.	IDUs should rely on disinfection to prevent infection with HIV and hepatitis C virus only when they cannot stop injecting or do not have access to new, sterile injecting equipment.
	Outreach and			Evidence is very limited regarding the impact of outreach on HIV incidence.	

Target group	Method	Sub method	Mechanism	Evidence	Issues
	education				
Question 4: To what extent do these programs also increase the use of health and social services and drug treatment?					
This issue has not been well-studied across interventions. Few studies have examined whether participation in drug dependence treatment leads to increases in the use of health and social service. The few studies of multi-component HIV prevention programs that include needle and syringe exchange and link drug users with health and social services showed a moderate uptake of these services (Porter et al., 2002; Riley et al., 2002; Strathdee et al., 1999). However, none of the studies included comparison or control groups, so the overall use of such services among drug users who do not rely on NSE is unknown					
Question 5: What evidence is there that programs aimed at reducing the risk of HIV transmission among IDUs are more effective when they are part of a comprehensive array of services?					
				most prevention programs have multiple components. However, there are few, if any, examples of true ―comprehensive" programs. As such, the evidence does not exist to fully answer this question.	many health policy and research organizations recommend a comprehensive HIV prevention strategy for IDUs
Summary	Use cost effectiveness and cost benefit analysis to drive choice of programs and strategies.	methadone maintenance treatment is associated with lower expenditures for injection-related events, such as comorbidity, crime, and transmission of HIV infection to others (			
		programs that include needle and syringe exchange are cost-effective			
		NSE and methadone maintenance therapy are quite cost-effective. But their CE in developing countries needs to be established.			
		For HIV prevention efforts to exert a public health impact, they need to be scaled up to provide adequate coverage of the target population(s). Scaling up prevention programs imposes certain infrastructure requirements.			
		Public perceptions of acceptability of some strategies are important and have to be addressed.			
		involvement and education of key stakeholders,			

Target group	Method	Sub method	Mechanism	Evidence	Issues
		such as community members, government agencies, nongovernmental groups, public health officials, and law enforcement officials are critical to the success of HIV prevention programs for IDUs. A key realization when such communication occurs is that many disagreements over priorities and strategies stem from a lack of information about the focus, methods, and evidence base of the competing factions.			
		programs to prevent the initiation of injecting drug use—and drug use in general—can and should be part of a comprehensive, sustained approach to preventing HIV transmission among IDUs. Broader population-based efforts at HIV awareness and prevention can provide a foundation for sustaining such efforts for IDUs			
		investments in the infrastructure to deliver clinical and supportive services to the general population will be needed and will have benefits beyond the IDU population			
Community based outreach programs					
Source: WHO: ***Evidence for action: effectiveness of community-based outreach in preventing HIV/AIDS among injecting drug use*** 2004 ISBN 92 4 159152 8					
		Community-based outreach is designed to access hidden or partly hidden populations of drug users in their natural surroundings and engage them in HIV prevention and treatment activities.	to reduce their injecting and sexual risk behaviour, especially multi-person reuse of contaminated syringes, needles and other drug injection equipment as well as unsafe drug-sharing practices, and to reduce their exposure to HIV	IDUs reached by community-based outreach and provided access to risk-reduction services – risk-reduction information and messages about safer drug use and needle practices, supplies of condoms, bleach, syringes (in some programmes) and referral to or provision of additional prevention and treatment services (voluntary testing and counselling, needle exchange programmes and treatment for HIV disease) – report reducing their risk	

Target group	Method	Sub method	Mechanism	Evidence	Issues
				behaviour and lowering their exposure to HIV. Evidence is available indicating that IDUs – referred by outreach workers to available, accessible and acceptable services such as voluntary testing and counselling and drug dependence treatment – increasingly use these services and reduce their HIV risk behaviour.	
Is outreach an effective strategy for reaching hard-to-reach, hidden populations of IDUs and providing the means for changing behavior ?					
			except for a few countries, reporting with great confidence about coverage or the portion of the IDU population reached by community-based outreach is difficult		
Is outreach work associated with decreasing risk behaviour and increasing protective behavior among IDUs?					
			outreach-based interventions have been effective in reaching out-of-treatment IDUs and providing the means for		Most studies were conducted in the US

Target group	Method	Sub method	Mechanism	Evidence	Issues
			effective behaviour change		
				these studies consistently report significant and strong post- intervention reductions in 10 of the 11 studies of outreach related to cessation of injection drug use, reduced injection frequency (17 of 18), reduced multi-person reuse of syringes (18 of 22), reduced use of other injection equipment (9 of 13) and reduced crack use (8 of 8). These studies also report increased needle disinfection (11 of 17), increased entry into drug treatment (7 of 8) and increased condom use (18 of 21).	
				Studies from the United States and India reveal that drug users are less likely to reduce risky sexual behaviour than to change drug use and needle practices. Outreach-based peer programmes have been repeatedly reported to be more effective in enabling IDUs to change their drug-using and needle risk behaviour than their sexual behaviour (Stephens et	

Target group	Method	Sub method	Mechanism	Evidence	Issues
				al., 1993; Kumar et al., 1998).	
Are the changes in behaviors as a result of outreach work associated with lower rates of HIV infection ?					
				Strong evidence indicates that outreach reaches atrisk HIV-vulnerable populations, provides the means to reduce the risk associated with multi-person reuse of syringes, results in reports of reduced sharing of syringes and other injection equipment and increases the use of other services, especially voluntary counselling and testing and drug treatment services. One	Attempts to answer the question of whether post-intervention reductions in risk behaviour result in fewer infections. The number of empirical studies is limited, but the results are promising.
				Review of more than 40 studies indicates consistency in the direction and strength of the association between outreach and the specificity of behaviour change. The magnitude of post-intervention changes in risk behaviour is substantial. Reports are consistent that interventions targeting IDU-specific risk behaviour related to drug use and needle practices reduced these types of risk behavior	although outreach programmes are often the easiest to start, they may be difficult to maintain and to scale up to have the impact necessary to prevent the further spread of HIV, especially when disconnected from other services

Target group	Method	Sub method	Mechanism	Evidence	Issues
				The cumulative evidence reviewed supports the conclusion that outreach is causally associated with reduced risk behavior and reduced exposure to HIV.	Critical issues emerging from the literature are training, supervision and compensation for outreach work.
				In sum, the science-based evidence from more than 15 years of research indicates that community based outreach is an effective strategy for reaching hidden populations, for providing the means to enable IDUs to change their behavior and for reducing their exposure to HIV	
MSM					
Source: ***The Effectiveness of Individual-, Group-, and Community-Level HIV Behavioral Risk-Reduction Interventions for Adult Men Who Have Sex with Men: A Systematic Review*** Am J Prev Med April 2007;32(4S):S38–S67					
	Individual level, group level and community level HIV behavioural interventions	reducing risky sex behavior and maintaining safer sex practices. promote change in sex behaviors (e.g., increase condom use, decrease	provision of relevant information, training, or support through a personal interaction between a deliverer and an MSM.	The evidence found in our review shows that individual-level, group-level, and community-level HIV behavioral interventions are effective in reducing the odds of unprotected anal intercourse (range 27% to 43% decrease) and increasing the odds of condom use for the group-level approach (by 81%).	The primary sexual risk behavior outcomes include unprotected AI, use of condoms during AI, and number of sex partners. Each of these outcomes has been empirically linked to acquisition of HIV51,52 and other STDs.

Target group	Method	Sub method	Mechanism	Evidence	Issues
		unprotected anal intercourse (AI), and reduce number of sex partners) that reduce the likelihood of HIV acquisition. designed to promote individual behavior change and, in community interventions, widespread change in individual beliefs about social norms in the community			
				group- and community-level HIV behavioral interventions for adult MSM are not only cost effective but also result in actual cost savings	

Target group	Method	Sub method	Mechanism	Evidence	Issues

A health system comprises of all organizations, institutions, and resources devoted to producing actions whose primary intent is to protect and improve health.

Health system strengthening is the improvement in the performance of those health system building blocks required to deliver evidence based services and interventions at high enough coverage to achieve specific health goals.

The health system building blocks include:

Health Services and Delivery…	concerns the organization, management and provision of effective, high quality, evidence based interventions (preventive or curative) provided and demanded either individually or more commonly, within an agreed upon "package" of essential healthcare services.
Health Workforce…	is all people engaged in actions whose primary intent is to protect and improve health. A country's health workforce consists broadly of health service providers and health management and support workers. This includes private as well as public sector health workers, unpaid and paid workers, lay and professional cadres.
Health Information…	is the production, analysis, dissemination of reliable and timely data and information on health determinants, health systems performance and health status of the population. Health information includes the use of information by decision-makers at different levels of the health system, both on a regular basis and in emergencies.

Medical Products, Vaccines, and Technologies…	encompasses the creation and certification, the reliable procurement, distribution and use of essential medicines, vaccines, technologies medical products and supplies. It includes the establishment of norms, standards and policies, certification of new technologies and medical products, creation of essential medicines lists, clinical guidelines and protocols for use of these items.
Health Financing…	is the collection of revenues from households, companies, governments or external agencies, the allocation and use of those revenues for procurement, distribution and use of medical products, drugs and vaccines and for the delivery of evidence based interventions to populations in need.
Leadership and Governance…	Governance is the political, social, economic and administrative laws, rules, regulations, institutions and policies that affect the supply of and demand for health services in the public and private sectors focused on achieving health outcomes. Leadership is the ability to successfully integrate and maximize available resources within the internal and external environment for the attainment of organizational or societal goals

Thoughts from reading the Lancet HIV prevention papers

Expanded HIV prevention grounded in a strategic analysis of the epidemic's dynamics in local contexts is the *sine qua non* of getting ahead of the epidemic.

In the ideal, evidence-based world a program manager operates with perfect information, which includes at least the following:

- a known, fixed budget
- detailed, historical data for levels and distribution of HIV incidence and risk behavior
- cost-effectiveness estimates for the full set of feasible interventions, at all potential scales, targeted to different populations
  experience of implementation in different combinations
  All relevant positive and negative synergies between these different combinations in specific contexts would thus be taken into account
- In such an ideal world the manager would scale-up the most cost-effective mix of interventions until their marginal cost-effectiveness drops to the point at which the next best package is now more cost effective, and then scaling up these interventions until the next set becomes more cost effective, and so on.

We must address couples

We must address stigma in addressing MSM

The effectiveness of any prevention program depends on the extent to which effective interventions reach people at high risk of contracting the virus.

Improvement of the prevention response through better targeting requires understanding of the epidemiology of the virus, of human behaviors, and their drivers.

Analyses must capture not only current patterns, but also trends, so that planners can predict where infections are likely to occur in the future.

Because prevalence reflects infections that happened in the past, a more relevant question for prevention planners is ―where will the next 1000 infections occur?"

The limited data available indicate that many countries are not adequately focusing prevention resources where the epidemic is concentrated.

Analyses of recent coverage rates, as reported in country reports to the UN General Assembly Special Session (UNGASS) illustrate the mismatch between the populations at greatest risk of becoming infected or transmitting HIV and efforts made to reach them with prevention programs.

Taking effective action requires mapping and understanding the barriers and then planning concrete steps to address them.

The most important data to collect is trends in HIV incidence in different populations so that a country's epidemic can be understood, as well as for assessment of the effect of prevention programs.

Health system strengthening recommendations

INFORMATION

Taking effective action requires mapping and understanding the barriers and then planning concrete steps to address them.

The most important data to collect is trends in HIV incidence in different populations so that a country's epidemic can be understood, as well as for assessment of the effect of prevention programs.

Mapping and estimating the size of hard-to-reach populations, to allow assessment of trends over time. In generalized epidemics, population-based surveys that include a behavioural component at regular intervals (4–5 years) are recommended. More powerful and user friendly models or software should be developed to allow countries to estimate the number of new infections by transmission category on a regular basis.

National programmes must also implement regular monitoring of contextual factors, determinants of risk behaviour, and barriers to prevention. To do so effectively, standardised social science protocols that provide clear guidance on how to use qualitative and quantitative data collection methods are needed.

Prevention programmes must therefore include a complex set of interventions and approaches—biomedical, behavioural, community—tailored to the specific context.. Getting the mix right is important.

prevention strategies seem largely to ignore the existing evidence base because there is so little consistency in choice of interventions across countries with similar epidemiological and socioeconomic circumstances

The lack of any apparent relation between intervention mix and sero prevalence strongly suggests that decisions about the mix of prevention interventions were not heavily affected by a common evidence base on intervention effectiveness and cost

The lack of strong evidence for the effectiveness of different prevention programmes has several components.

First, the evidence base is incomplete because many components of prevention programmes have never been systematically assessed, or the studies are discarded because they do not meet minimum design criteria.

What can be done?

More information about the eff ectiveness and cost of diff erent prevention activities and packages is needed.

Better tools and guides are also needed to assess HIV prevention activities and programmes, especially for contextual or structural interventions as well as combinations of prevention methods.

Very little data exist about the current level of implementation of HIV prevention strategies. However, the limited literature available suggests that suboptimum effi ciency of implementation is very common

if there are not explicit regulations and incentives in place, there is no reason to expect effi cient behavior

need to track their cost per client served,

Two root problems of suboptimal response:

The fi rst is an excessive focus on improving today's results within current human and infrastructure capacity.

The second problem is the paucity of information and skills. Most prevention programmes lack data to inform results-based management (as well as the knowledge and skills to ensure that essential data are collected), to interpret the data to guide management, and to develop management structures that can eff ectively translate managerial decisions into actions at the point of delivery.

National programmes must also relieve the bottlenecks in infrastructure and human resources that prevent effi cient programme delivery.

Lastly, programme managers should promote and support the development of incentives and rules to regulate performance at the facility level and to ensure accountability and transparency. Even the best-trained, best-paid, best-equipped staff will only be successful in acting effi ciently if they work in an environment that provides the appropriate incentives and rules.

At the most basic level, managers need to know how much the prevention of an additional HIV infection costs, and how much prevention of that infection is worth to the country in question

widespread consensus that prevention is underfunded.

Because of the global commitment to funding expensive treatment for HIV/ AIDS, estimates suggest that prevention interventions that cost as much as $4770 per infection prevented would not just be cost eff ective, they would be cost saving.51 If one adds to that the value of years of healthy life lost because of an infection, as suggested by the Commission, then each infection prevented is of even greater value.

In terms of funding for improving programme eff ectiveness, the specifi c areas in need of funding are addressed in the previous sections—eg, epidemic information systems, the need for better data for intervention eff ectiveness, and the need for management information systems

Training eff orts should be substantially expanded, and funding must be conditional on results-based management

Some of this lack of explicit
leadership relates to the controversial nature of what
works in terms of HIV prevention, such as reduction of
harm for injecting drug users, sex education for children,
promotion of condom use, and societal norms about
sexuality, in particular homosexuality

the much-needed strengthening of health services in
developing countries might only be marginally benefi cial
for HIV prevention