

# Cost-effectiveness of harm reduction

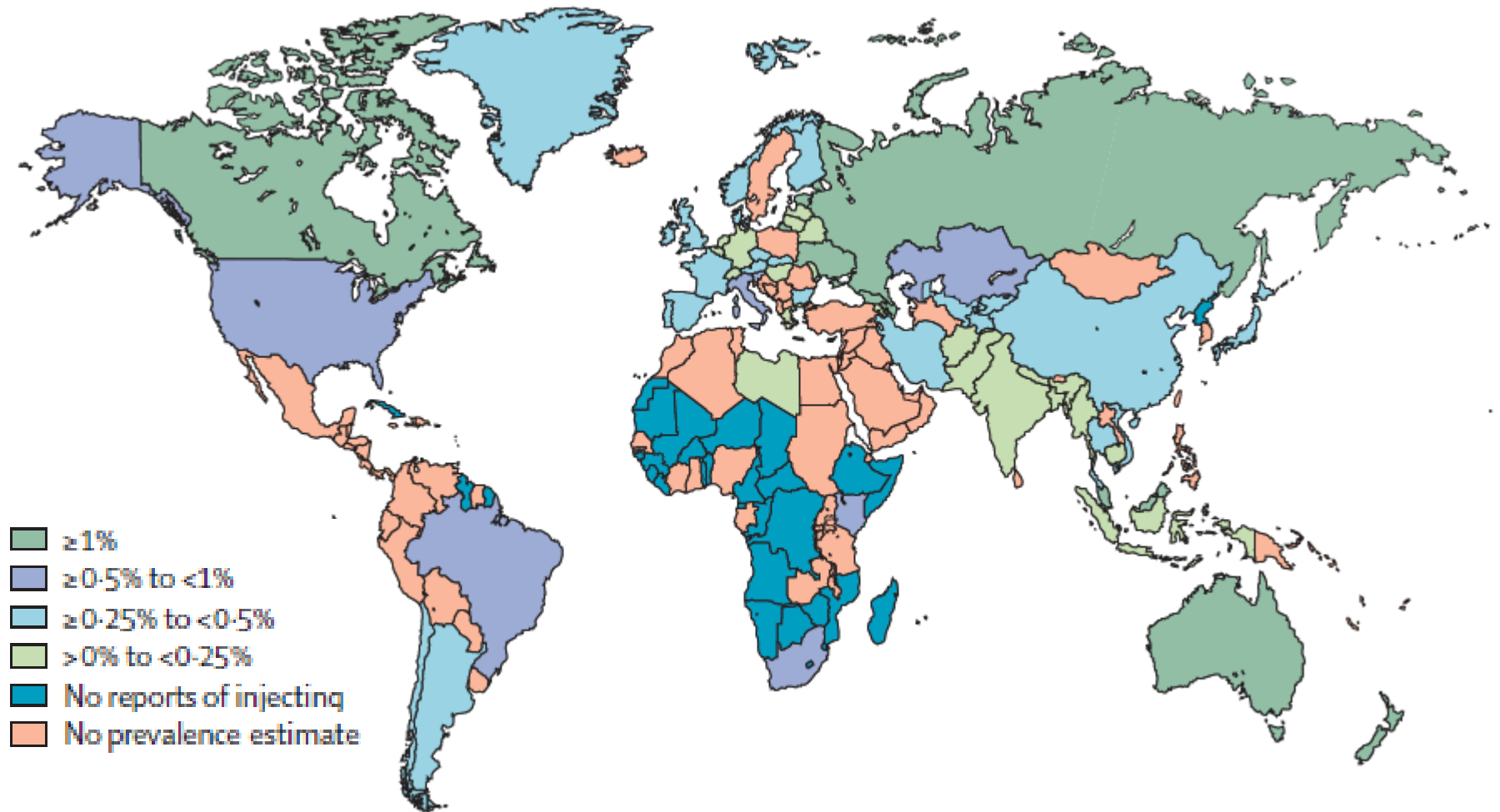
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Science Addressing Drugs And Health: State of the Art  
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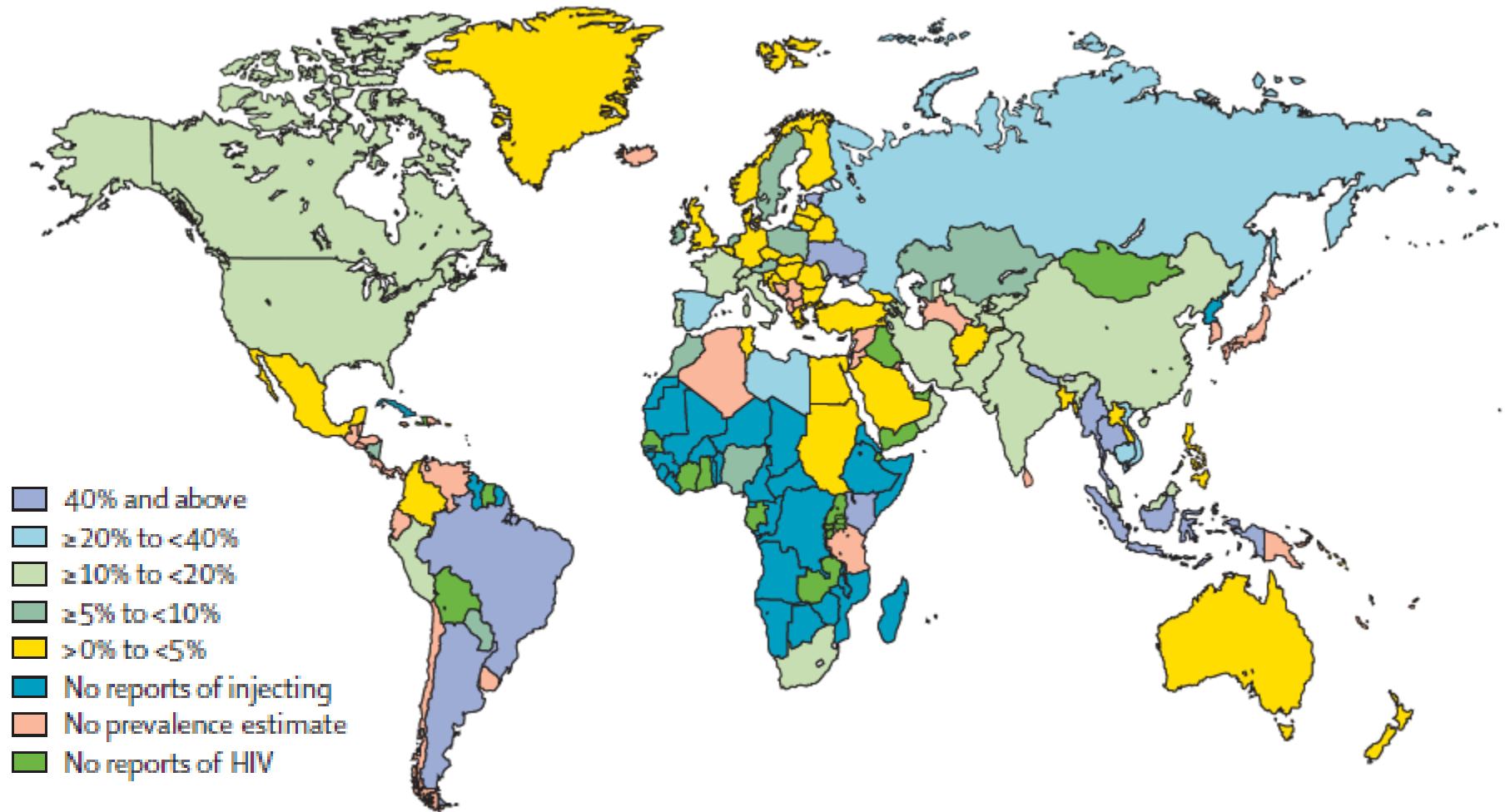
# Cost-effectiveness in decision making

- ❑ Competing priorities
- ❑ Limited resources available to be allocated for best outcomes
- ❑ Desire to implement effective programs
  - ❑ Interventions with proven efficacy and feasible
  - ❑ At least cost
- ❑ Comparative cost-effectiveness helps prioritize resource allocation

# Need to do something: Prevalence of Injecting Drug Use



# Need to do something: Prevalence of HIV among PWID



# Why worry?

Key population	Overall risk of HIV infection, relative to general population
Sex workers	13-fold higher
MSM	13.5 fold higher
<u>PWID</u>	<u>20-fold higher</u>

# What HR interventions work?

## ☐ Three proven priority interventions

- **NSP** - provide sterile needles/syringes and other injecting equipment to PWID. By maximising the number of clean injecting equipment in circulation, we minimise the time infected equipment remain in use and the proportion of unsafe injections
- **OST** - prescribed to dependent users to diminish the use and effects of illicitly acquired opiates. It is usually taken orally and therefore reduces the frequency of injection and unsafe injecting practices
- **ART** - is prescribed to HIV-positive PWID to treat AIDS and to reduce viral load and consequently HIV transmission

☐ 9-component comprehensive package, endorsed by WHO, UNODC and UNAIDS - Three priority interventions plus HCT, condoms, IEC, STI, HCV and TB prevention/treatment

# What we know about NSPs

- ❑ Review of evidence from 42 studies (Gibson et al, 2001)
  - ❑ 28 showed a favorable outcome
  - ❑ 2 showed an unfavorable outcome
  - ❑ Others showed no clear results or mixed findings
- ❑ Ecological studies: 81 cities (Hurley et al, 1997)

	NSPs	No NSPs
Number of cities	29	52
Change in HIV prevalence per year	-5.8%	+5.9%

# What we know about NSPs

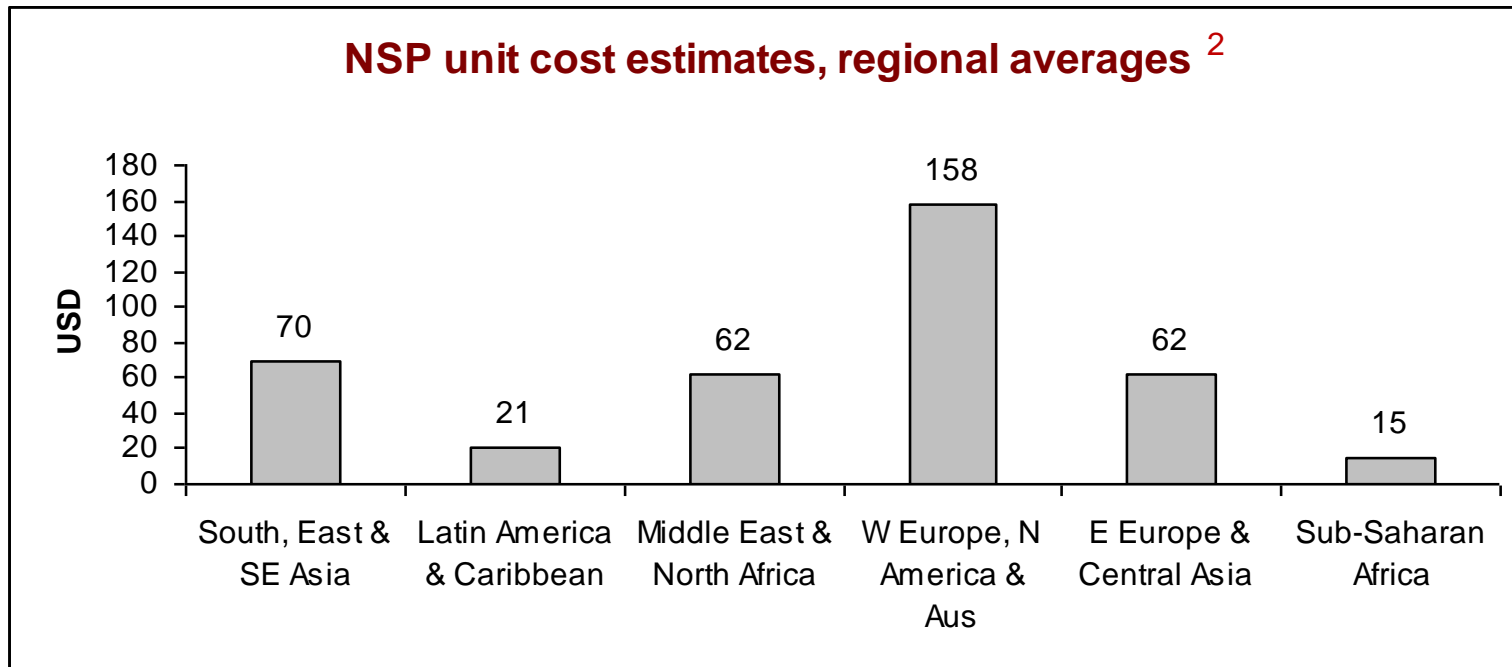
- ❑ Led to incidence declines
  - ❑ E.g. New York City: 4% to 1%
- ❑ Many places without NSPs have had large increases
  - ❑ E.g. Sargodha, Bangkok, Manipur, Cebu
- ❑ Reasons are obvious
  - ❑ Behavior in British Columbia exemplifies (Vancouver, Victoria)



# What are the cost ranges?

## NSPs

- ❑ Average cost of NSP provision \$23–71 /year<sup>1</sup>
- ❑ NSP cost varies by region and delivery system



<sup>1</sup> UNAIDS 2007 resource estimations; Schwartlaender et al 2011. <sup>2</sup> UNSW estimates, based on 10 studies identified in the 6 regions

# Cost-effectiveness of NSPs

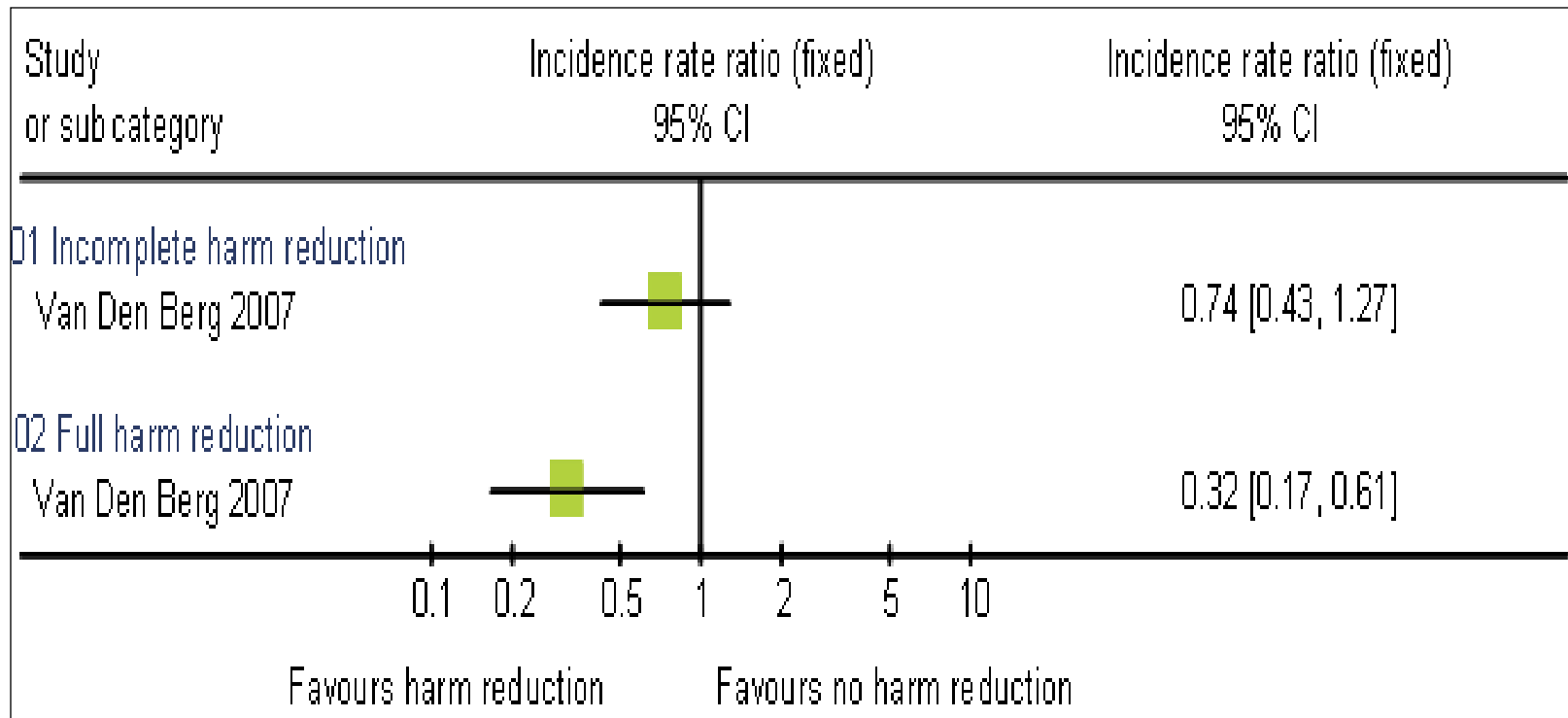
- ❑ Systematic review (Jones 2006)
  - ❑ 13 economic studies [most in North America]: all concluded that NSPs were cost-effective or cost-saving compared to lifetime cost of HIV
- ❑ Net financial benefits of NSPs in all regions; both high- and low- income settings
  - ❑ E.g. China (Ni et al 2012)
  - ❑ USA (Hrishikesh et al 2008)
  - ❑ Bangladesh (Guinness et al 2008)
  - ❑ Australia (Kwon et al 2012)

# What we know about OST

- All randomized controlled trials of OST have produced positive results (Mattick et al, 2003)
- OST reduces injecting activity  
(Cochrane Syst. Review; Gowing, 2008; Mattick, 2009)
- Meta-analysis (North America, Europe & Asia)
  - 54% reduction in HIV acquisition

# What we know about OST and the importance of combining the priority HR interventions to achieve impact

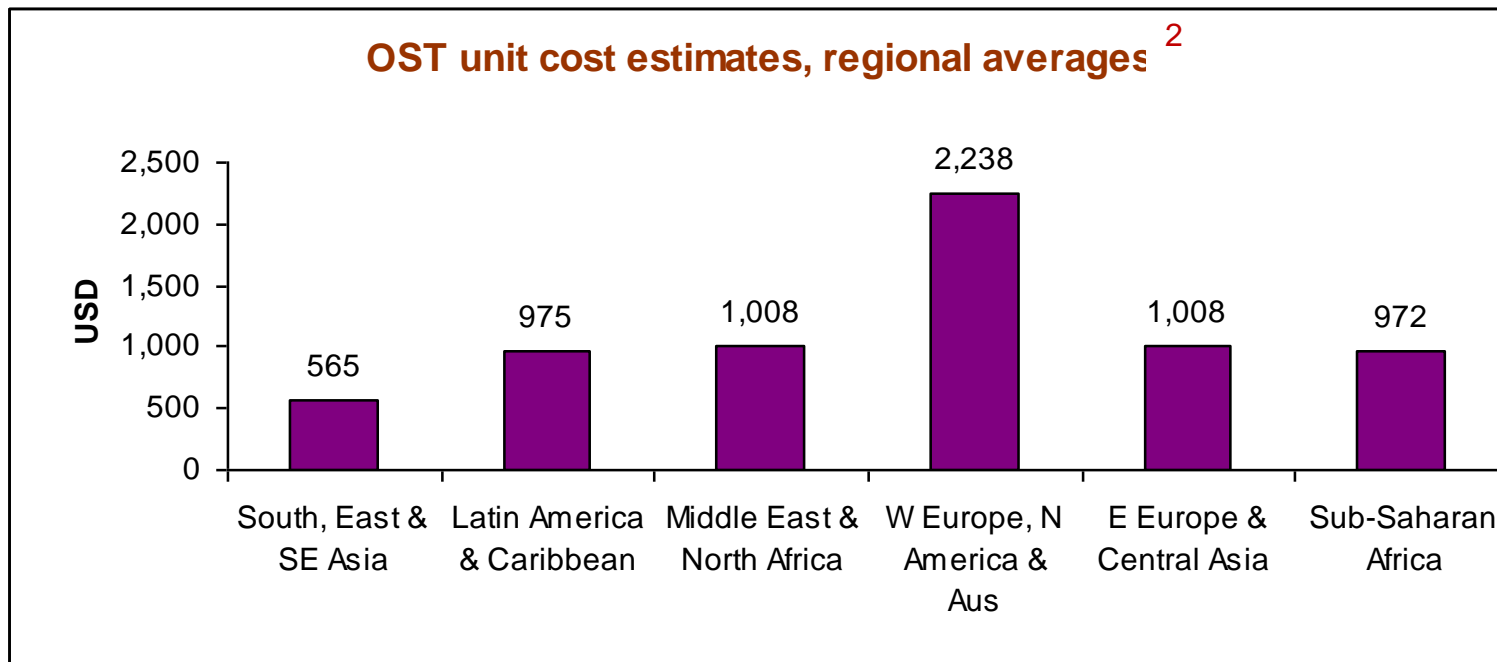
**Empirical evidence: NSP + OST at scale:** Amsterdam cohort study - 57% HIV incidence reduction, 64% HCV incidence reduction (incidence reductions low if service uptake partial). Similar findings in Central Asia.



# What are the cost ranges?

## OST

- ❑ **Average OST cost** : Methadone 80 mg: \$363 - 1,057 / year; Buprenorphine, low dose: \$1,236 – 3,167 /year<sup>1</sup>
- ❑ **OST** consistently far costlier than NSP



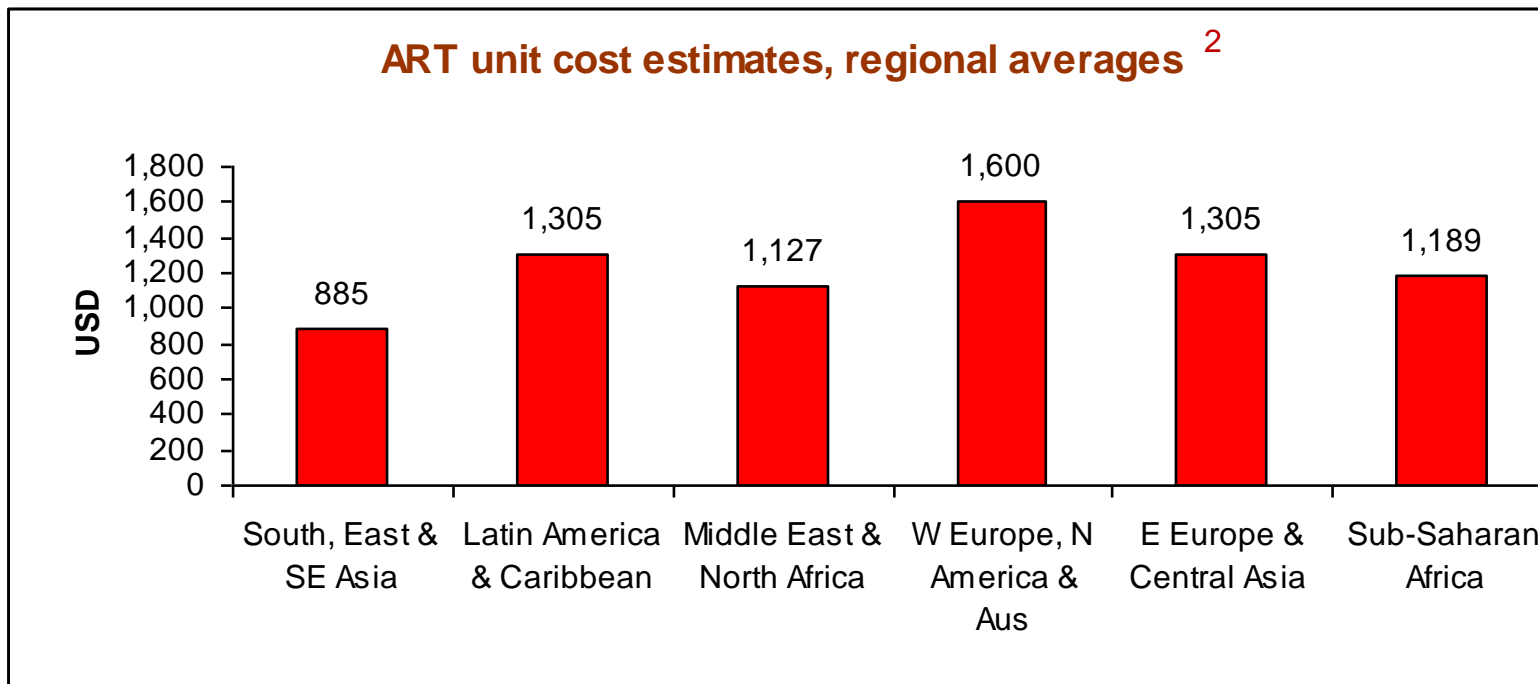
<sup>1</sup> UNAIDS 2007 resource estimations; Schwartlaender et al 2011. <sup>2</sup> UNSW estimates, based on 10 studies identified in the 6 regions

# What we know about ART

- ❑ Reverses disease progression and increases survival
  - ❑ Shown to be highly cost-effective
- ❑ Prevention
  - ❑ HPTN052: 96% reduction in infectiousness for heterosexuals on ART
  - ❑ no direct evidence for PWID
  - ❑ highly plausible that ART will be efficacious

# What are the cost ranges ART?

- ❑ **Average cost of ART provision:** UNAIDS minimum estimate \$176 in 2010, declining to \$125 by 2020<sup>1</sup>
- ❑ Estimated costs range from \$1,000-2,000 per HIV+ PWID



<sup>1</sup> UNAIDS 2007 resource estimations; Schwartlaender et al 2011. <sup>2</sup> UNSW estimates, based on 10 studies identified in the 6 regions

# What we know about ART as PrEP

- PrEP (Bangkok Tenofovir Study: 49% efficacy)
  - May not be cost-effective: Cost per infection averted
    - \$24,785-1,847,853 (high-income countries)
    - \$4,233-74,642 (discounted tenofovir)
    - \$1,166-17,791 (generic tenofovir)



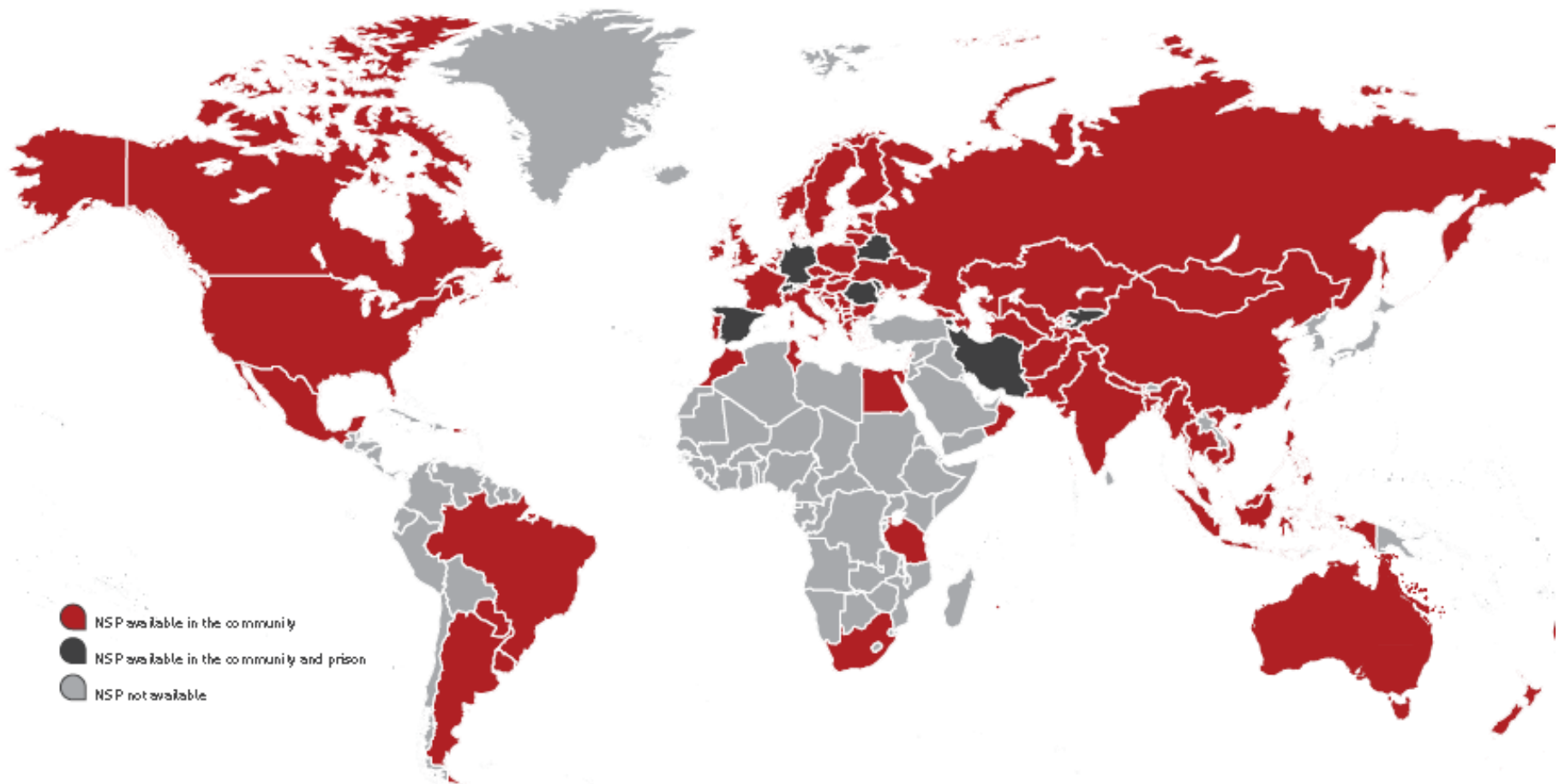
# Priority HR intervention packages are cost-effective and cost-saving

- ❑ Estimated cost-effectiveness ratios for priority intervention package favorable in all regions
  - ❑ costs per HIV infection averted: \$100 to \$1,000
- ❑ In all regions with data on return on investment, harm reduction packages are cost-saving
  - ❑ Total future ROI \$1.1 – 8.0 (3% discounting)

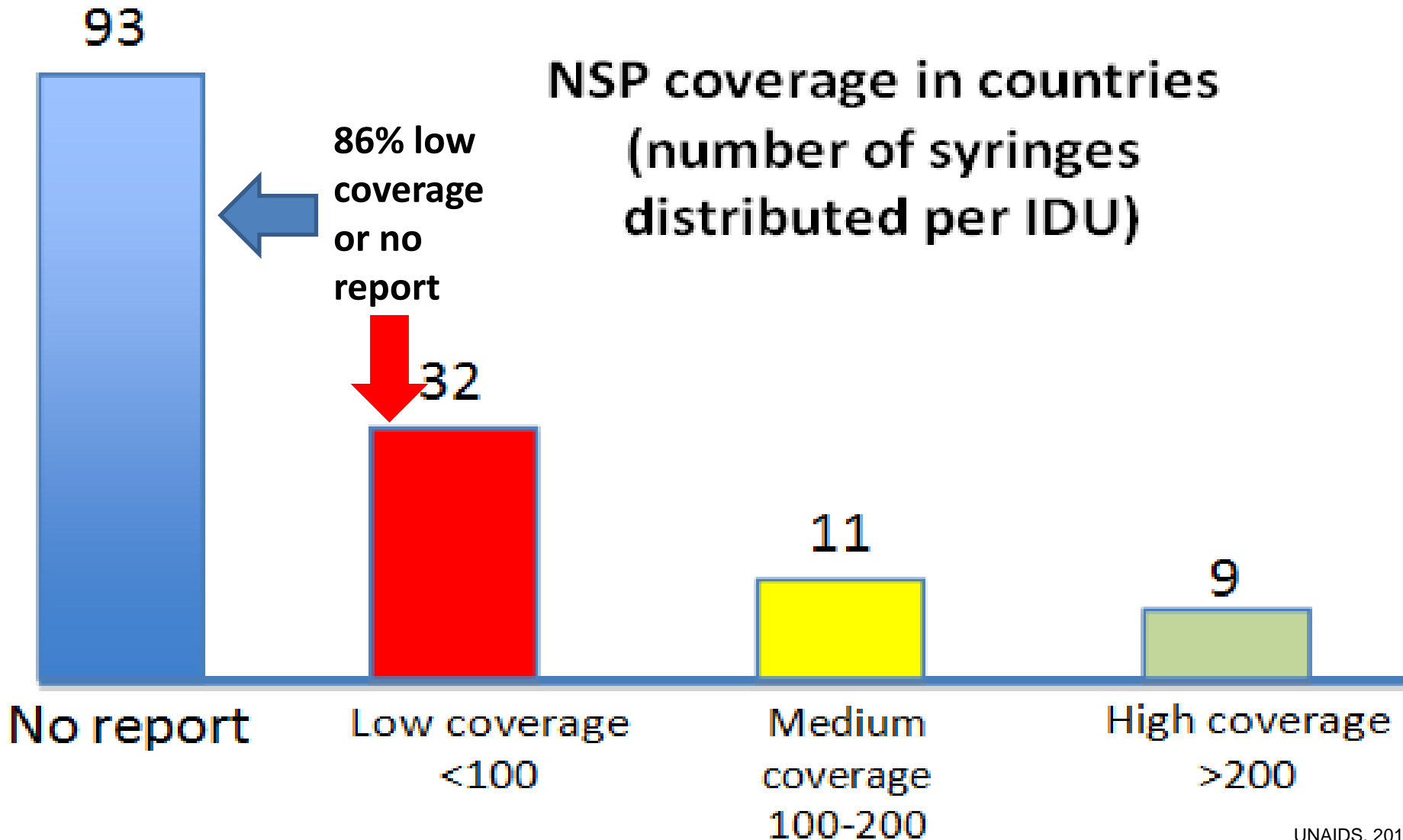
**What is the current coverage  
of NSP, OST and ART among PWID?**

# Where NSP is available as per policy

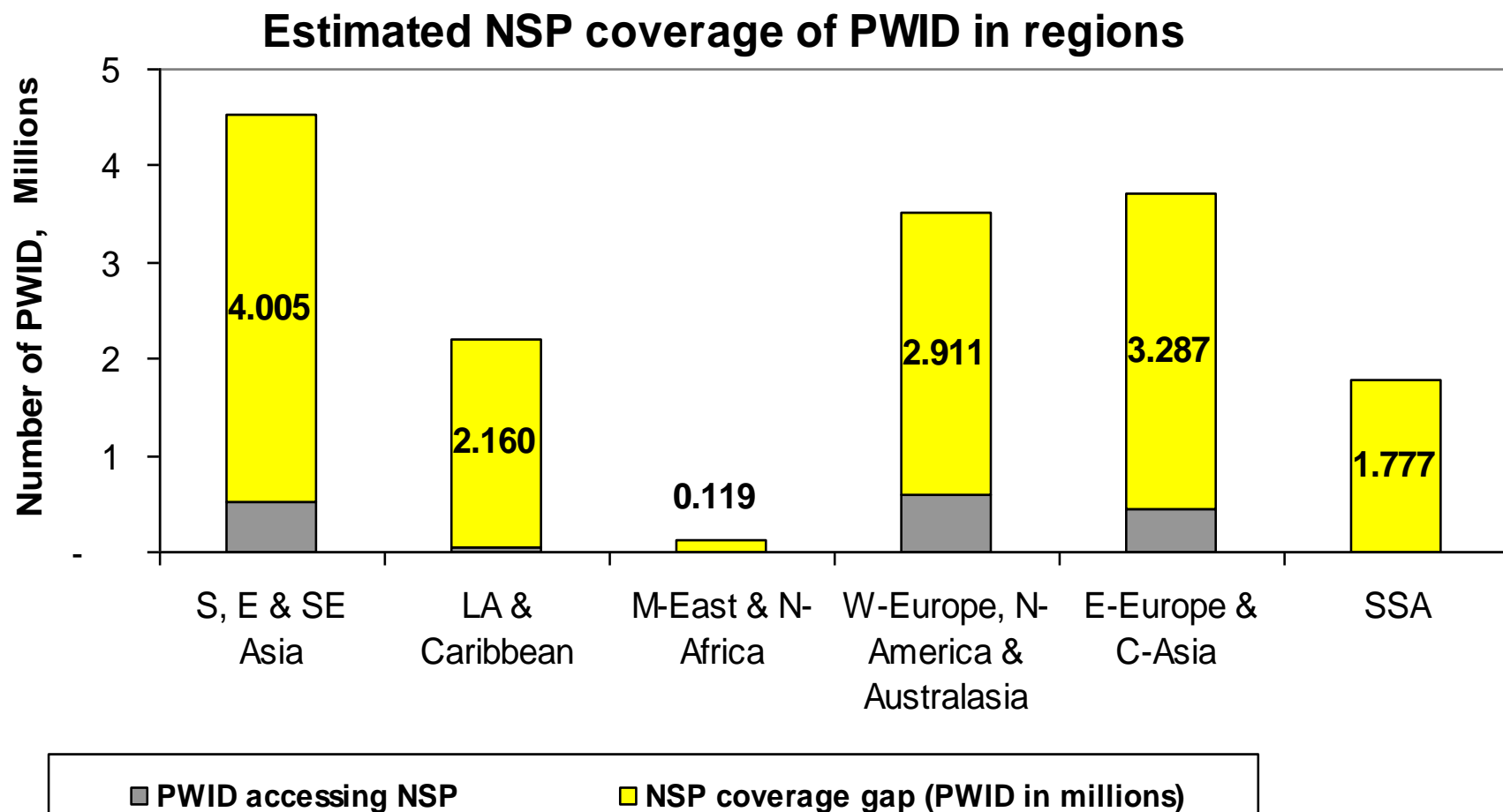
(black: community and prison, red: community only)



# Implementation and coverage limited



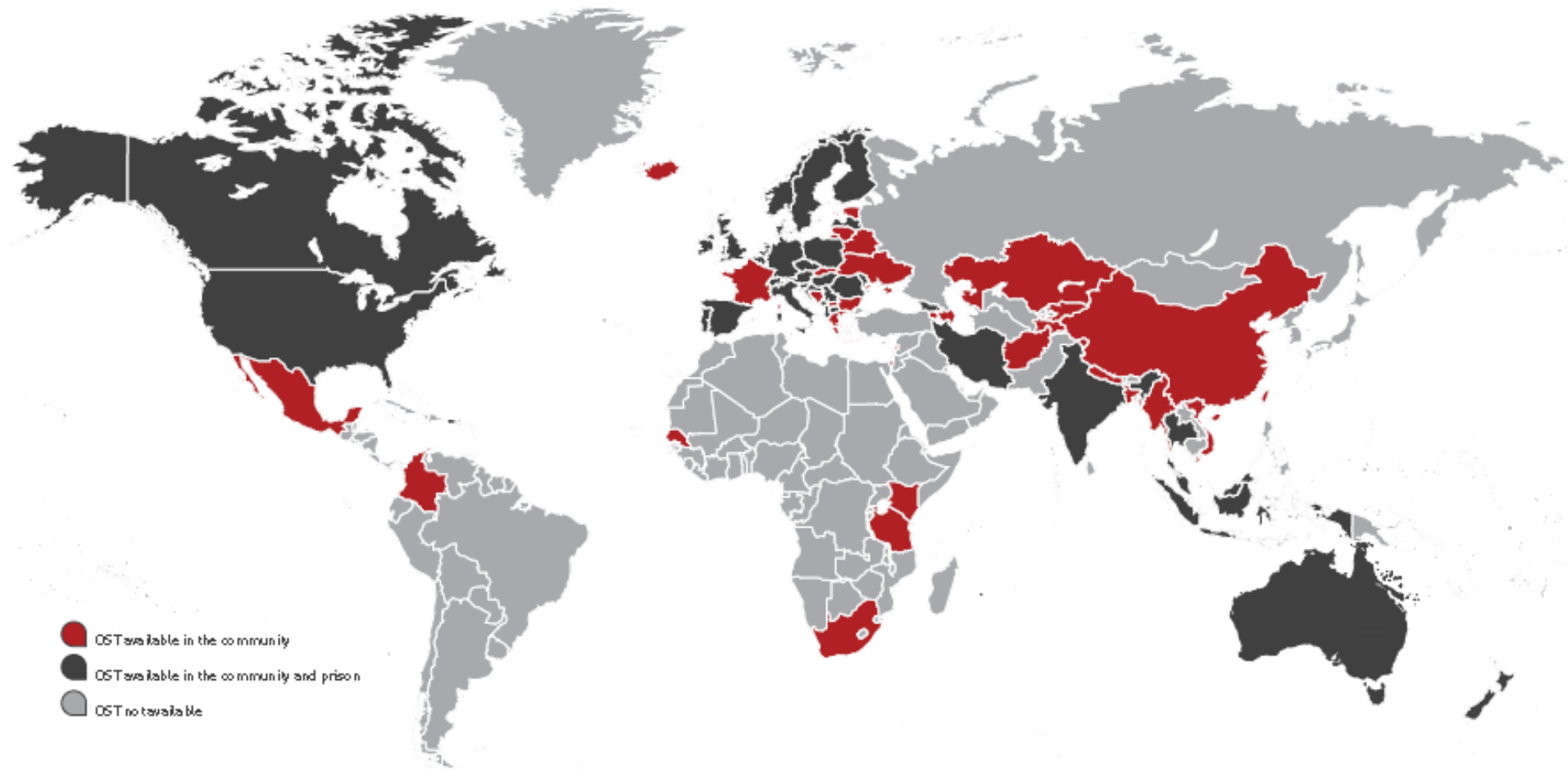
# Worldwide, over 14 million PWID (90%) may not access NSP



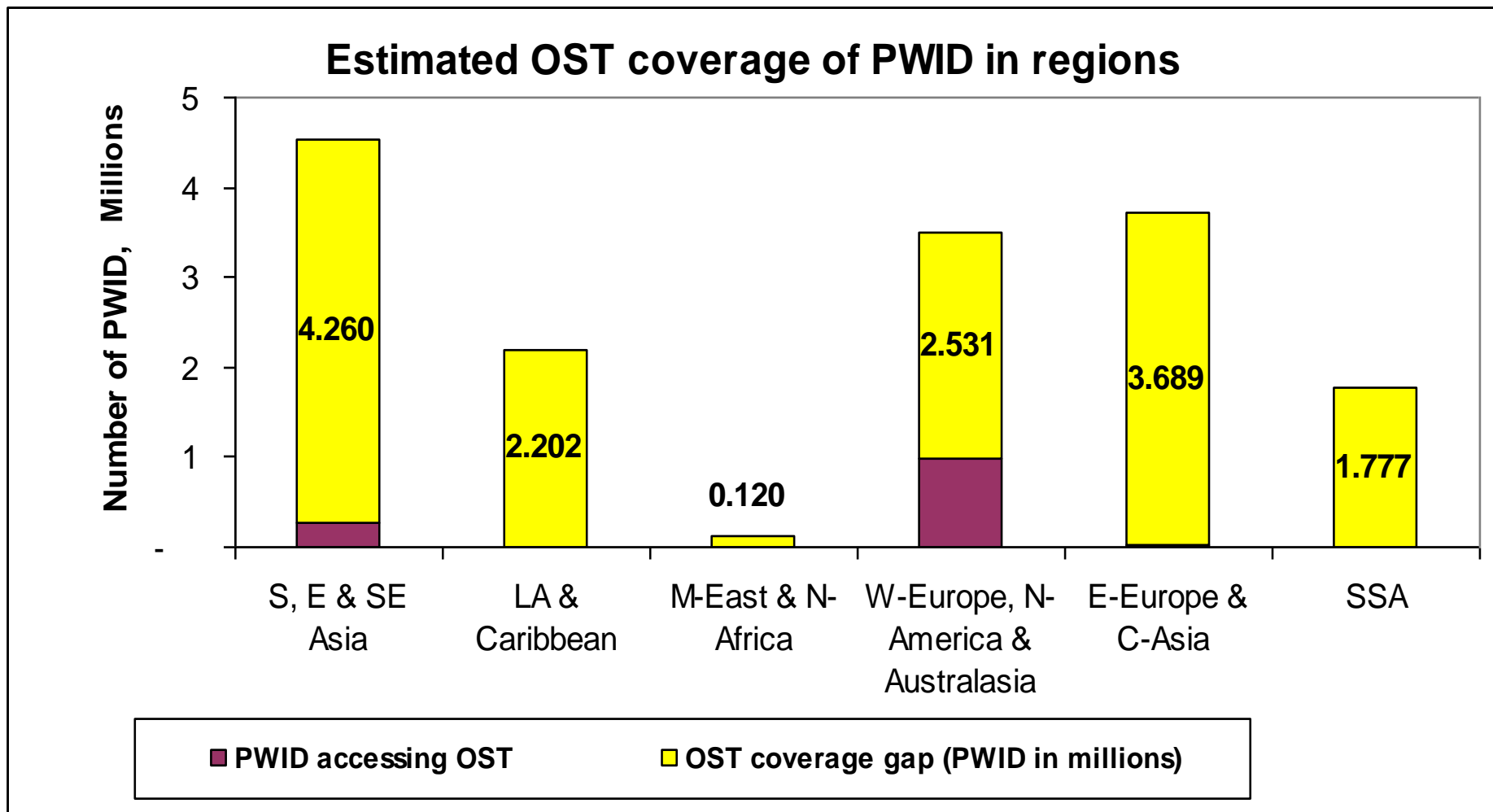
Source: Authors' literature and estimations, based on Mathers et al., 2010

# Where OST is available as per policy

(black: community and prison, red: community only)



# Almost 15 million PWID (92%) may not use OST



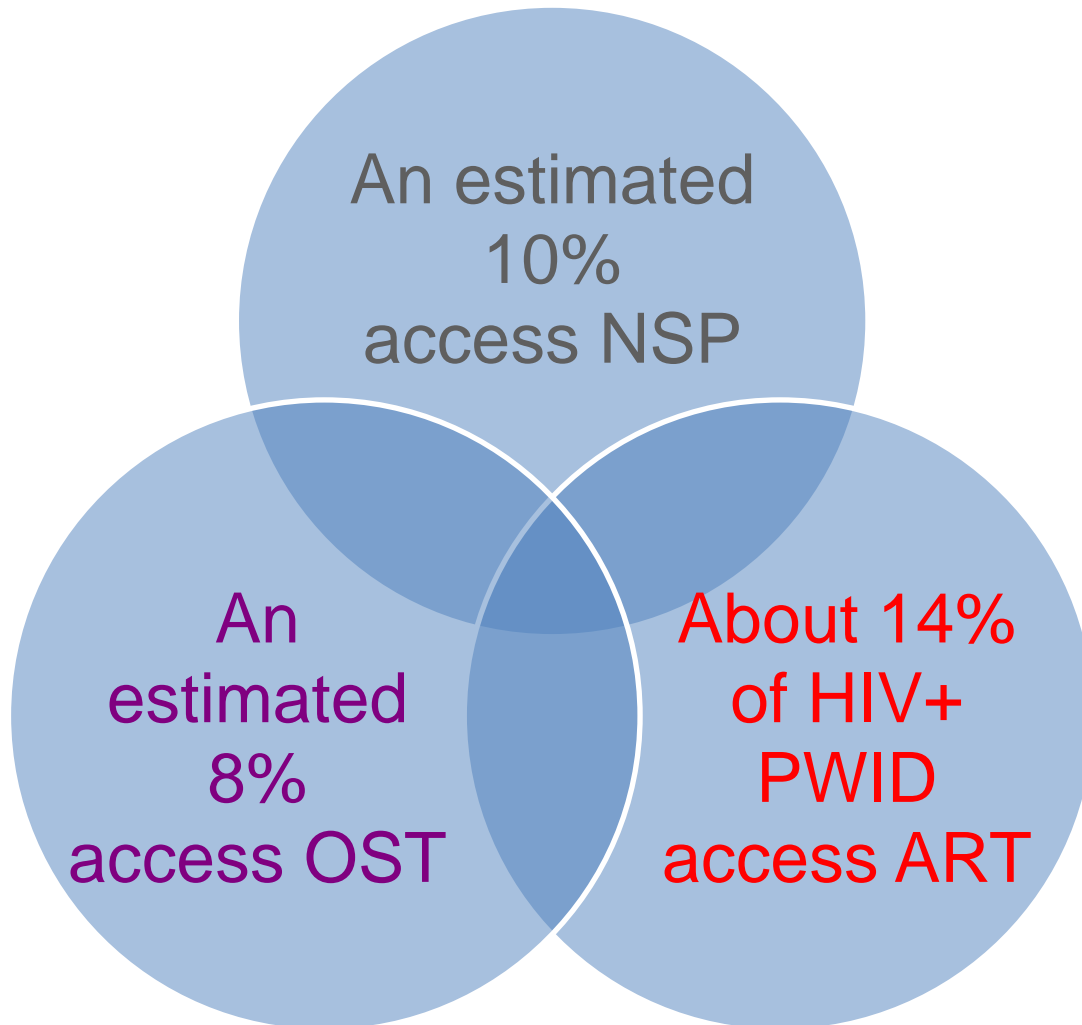
Source: Authors' literature and estimations, using Mathers et al., 2010

# ART coverage in HIV+ PWID

- ❑ **ART uptake of HIV-infected PWID shows the largest discrepancies across regions**
  - Outside high-income countries, ART coverage in PWID is less than 5%.



# What is the global coverage of HR services?

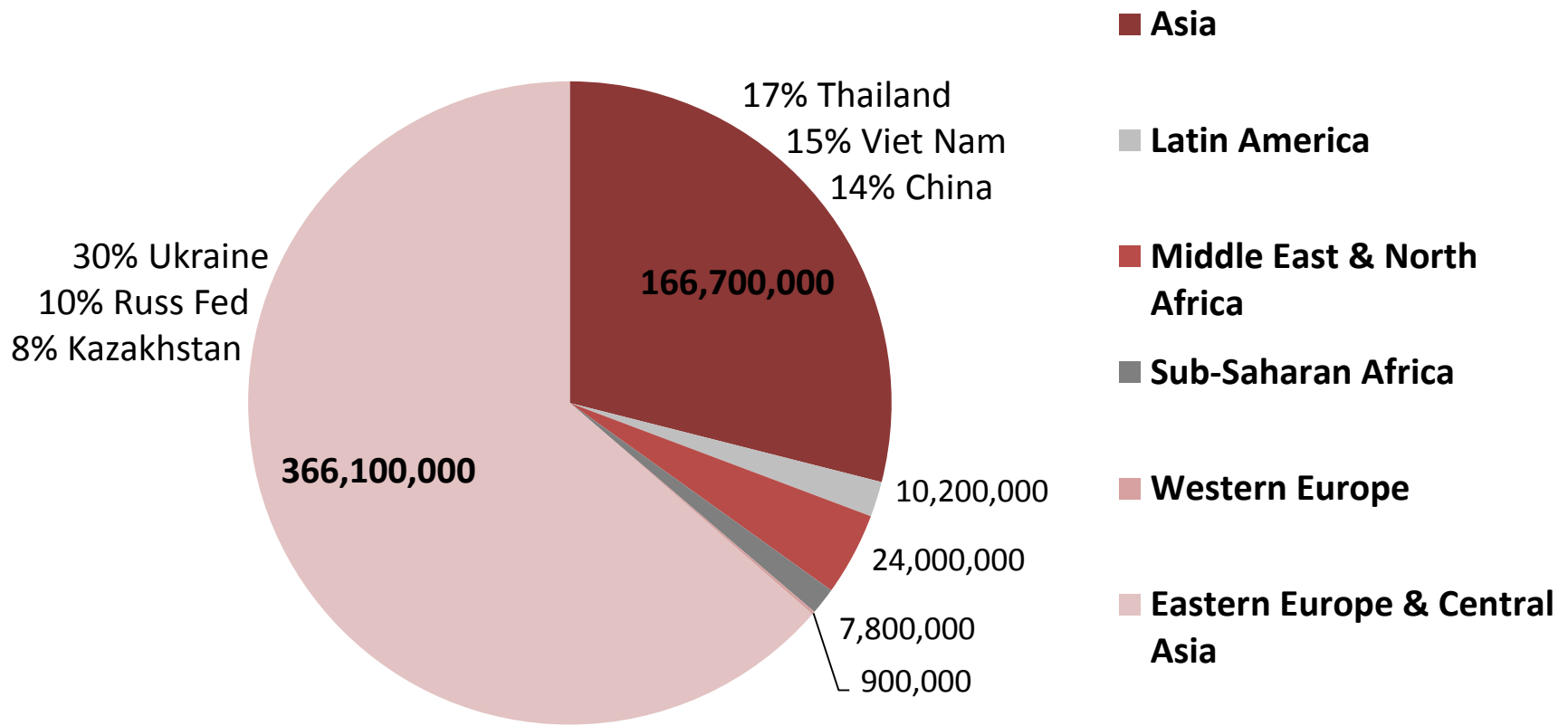


***A small proportion of PWID access all three priority interventions***

# How much is spent on HR?

- ❑ Plausible estimate of **~\$160 million in LMIC in 2007 (or 3 cents per PWID per day)** for HIV-related HR, of which 90% from international donors.
- ❑ **Global Fund** largest funder for HR targeted at PWID

# Global Fund PWID investments by Region (US\$)



Sources: Bridge 2012, summarised in Global State of Harm Reduction, 2012

# How much is needed to scale up the priority HR interventions?

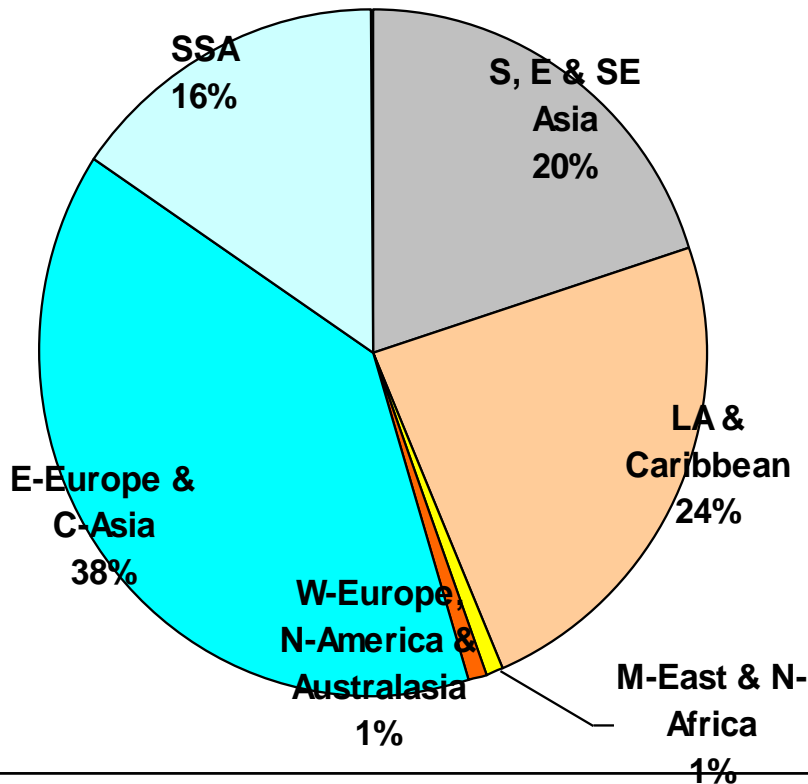
Two scenarios: “mid target” and “high target”

	NSP coverage (%)	Needles / PWID /year	OST uptake	ART uptake of HIV+ PWID
<b>Current estimated level</b>	<b>10</b>	<b>22</b>	<b>8</b>	<b>14</b>
<b>Scenarios:</b>				
<b>Mid target</b>	<b>20</b>	<b>100</b>	<b>20</b>	<b>25</b>
<b>High target</b>	<b>60</b>	<b>200</b>	<b>40</b>	<b>75</b>

## Summary: Annual cost of scale-up of NSP, OST and ART for PWIDs (USD)

	<b>Mid target</b> 20% NSP coverage 20% OST coverage 25% ART coverage	<b>High target</b> 60% NSP coverage 40% OST coverage 75% ART coverage
South, East & South East Asia	527 million	1,491 million
Latin America & Caribbean	625 million	1,468 million
Middle East & North Africa	26 million	55 million
W- Europe, N- America & Australasia	17 million	1,193 million
Eastern Europe & Central Asia	1,037 million	2,513 million
Sub-Saharan Africa	414 million	901 million
<b>Total per year (USD)</b>	<b>2,645 million</b>	<b>7,621 million</b>

# Annual scale-up costs: Split by region and intervention



## Mid target scenario:

- ❑ Costs dominated by scale-up needs in Eastern Europe and Central Asia
- ❑ Most resource intense intervention to scale-up is OST (71% of total mid target costs), then ART for HIV+ PWID (26%), than NSP (3%)
- ❑ Similar pattern for high target scenario

# Conclusions

- Globally, harm reduction interventions are good value for money, improving health outcomes for PWID.
  - ~US\$100 to \$1,000 per HIV infection averted
  - NSPs: Moderate-to-strong effectiveness and cost-effectiveness
  - OST: Strong evidence for effectiveness.
    - Questionable cost-effectiveness when considering just HIV or HCV alone; moderate cost-effectiveness when drug-related issues included
  - OST + NSP: Strong cost-effectiveness
  - ART: Cost-effective for survival, weak evidence for prevention, PrEP not cost-effective