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Strategies for acceleration of HIV prevention interventions that work

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1. Introduction

- Remarkable advances in the molecular biology of HIV and major therapeutic discoveries in the past 28 years of the epidemic.
- Attention to treatment access has undoubtedly increased in recent years. However, for every patient who initiated ART in 2006, six other individuals became infected with HIV
- Effective HIV prevention is, therefore, paramount. In the absence of a drastic reduction in the number of new infections, national effort for universal access to treatment will be in serious jeopardy, and many more people may die as a result of preventable HIV infections.
- Prevention efforts should be based on the best available epidemiological and social science evidence

2. Measuring evidence in HIV prevention

1. **Systematic reviews and meta-analysis**

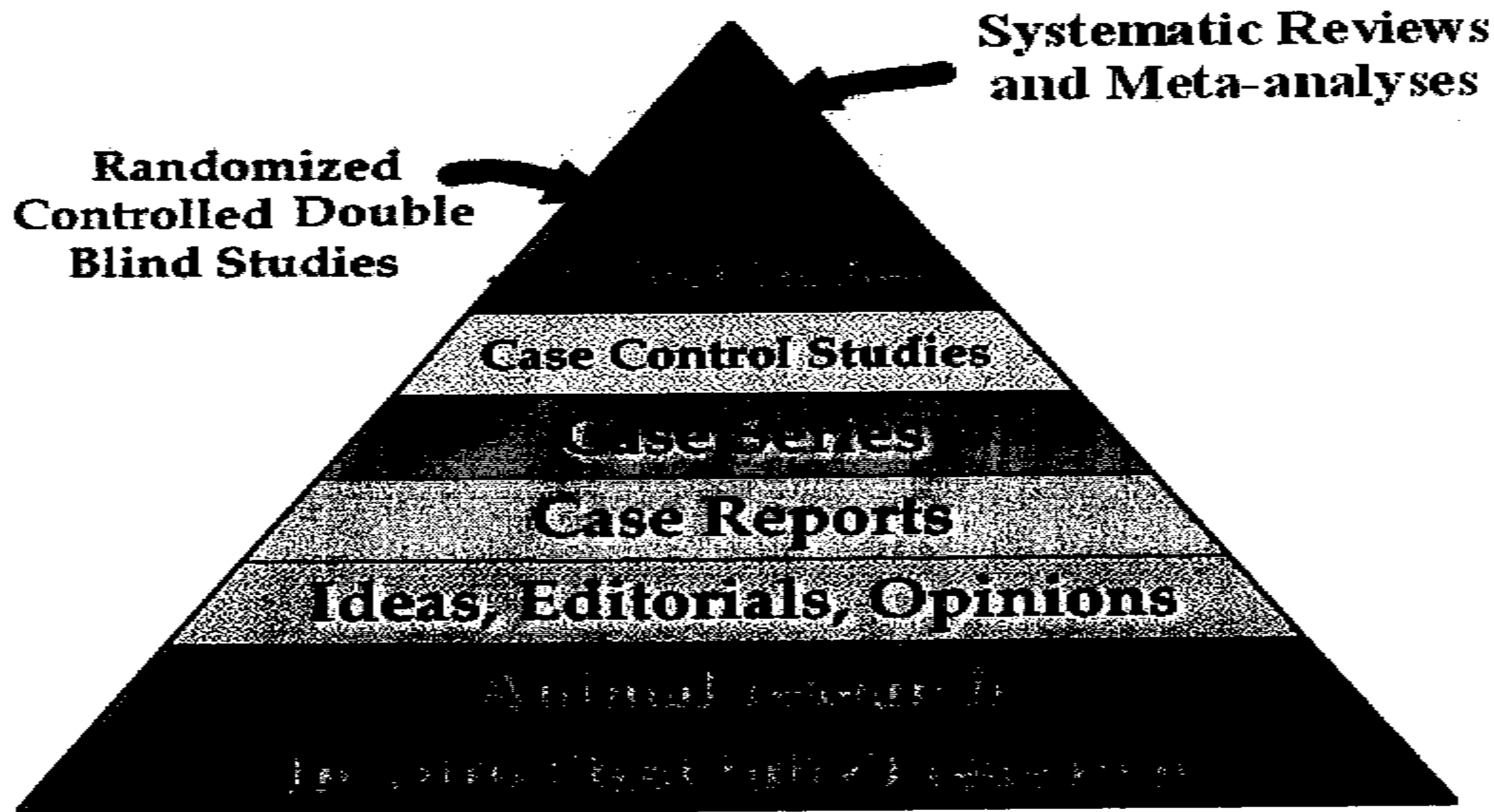
2. **Experimental designs**
   - Randomised Controlled Trials (RCT) are "gold standard"
   - Cohort studies
   - Case-control studies

3. **Quasi-experimental designs**
   - Pre and post-test intervention surveys

4. **Survey designs**
   - Cross-sectional surveys
   - Case studies

5. **Qualitative research**
   - Key Informant Interviews and Focus Group Discussions
   - Participant observation

The Evidence Pyramid



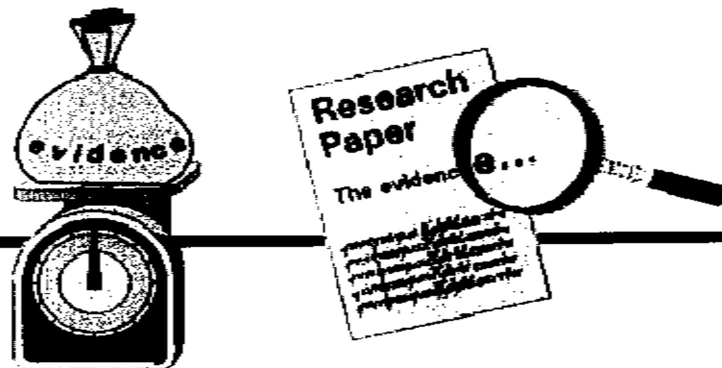
"RCTs in South Africa, Uganda and Kenya – were the "gold standard" for obtaining evidence of effectiveness."

Source: http://library.downstate.edu/EBM2/2100.htm

No "Magic Bullet" for HIV

"It is critical to note that there is no "magic bullet" for HIV prevention. None of the new prevention methods currently being tested is likely to be 100 percent effective, and all will need to be used in combination with existing prevention approaches if they are to reduce the global burden of *HIV/AIDS*."

Source: Global HIV Prevention Working Group (2008)



3. Accelerating on Biomedical HIV prevention interventions that work

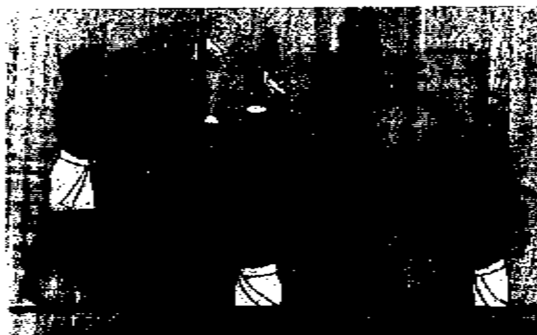
- Male circumcision (MC)
- Antiretroviral therapy (ART)
- PMTCT
- Condoms
- STI treatment

3.1.1. Male Circumcision

- Efficacy studies in South Africa, Uganda[1], and Kenya: "There is compelling evidence that MC is 65% effective in reducing the risk of acquiring HIV in circumcised men…"

- A systematic review by the Cochrane Collaboration assessed data from trials in SA, Uganda, and Kenya between 2002 and 2006 that enrolled 11,054 males said that research on the effectiveness of MC for preventing HIV in heterosexual men is conclusive.

  Reviewers concluded that no further trials are required to establish that HIV infection rates are reduced in heterosexual men for at least the first two years after circumcision[2]



[1] Gray, H. et al. MC for HIV prevention in young men in Rakai, : An RCT. Lancet 369:657-66. 2007

[2] Siegfried N, Muller M, Volmink J, Deeks JJ, Egger M, Low NN, Weiss HH, Walker SA, Williamso PR. MC for prevention of heterosexual acquisition of HIV in men. *Cochrane Database* 2003, Issue 3.

3.1.2. Antiretroviral therapy (ART)

- By the end of 2007, an estimated 3 million people in low- and middle-income countries were receiving antiretrovirals - a 42% increase over December 2006 and a tenfold rise over the previous five years.
- Case study 1: Namibia – ARV treatment coverage was negligible in 2003. 88% of individuals in need were on ART in 2007.
- Case study 2: Rwanda - ARV coverage increased from 1% in 2003 to almost 60% in 2007.

3.1.3. Preventing mother-to-child transmission (PMTCT) of HIV

- Although clinical trials have demonstrated the effectiveness of ART in reducing the risk of MTCT by 50%[1], only 11% of HIV-infected pregnant women in African countries receive ARV prophylaxis.
- The scale-up of PMTCT using ARVs has increased from less than 10% in 2005 to 34% in 2007.
- Case study: Botswana Government made PMTCT a national priority and coverage reached 80%, and the infection rate for children born to HIV-infected mothers was reduced to 4% in 2007, demonstrating the feasibility and impact of such programmes in resource-limited settings[3]

[1] Guay, L et al. "Intrapartum and neonatal single-dose nevirapine compared with Zidovudine for MTCT of HIV-1 in Kampala, Uganda: HIVNET 012 Randomized Trial. Lancet;354:795-902. 1999
[2] The XVII International AIDS Conference Impact Report: From Evidence to Action. . 3-8 August 2008, Mexico City
[3] United Nations (2008). Implementation of the Declaration of Commitment on HIV/AIDS and the Political Declaration on HIV/AIDS. Report of the General Secretary, 62. 1 April 2008.

Summary: Biomedical HIV prevention interventions that work

Intervention	CRCT or IRCT *	RCTs showing efficacy	RCTs completed		RCTs ongoing	
Microbicides	IRCT	**0**	**4**	Kreiss 1992 Roddy 1998 Richardson 2001 Van Damme 2002	**5**	C3IG (2) Carraguard HPTN 035 (Buffergel, Pro2000) MDP Pro2000
HIV Treatment	IRCT	**0**	**0**		1	HPTN 052 (discordant couples)
STD Treatment	IRCT	**0**	14	Kaul, 2004	**3**	NIIAD/GF HSV-2 trials LSTMH HSV-2 trial
	CRCT	1 Grosskurth, 1995	**4**	Grosskurth, 1995 Water 1999 Kamali, 2003 Greg son 2005		
HIV Vaccines	IRCT	**0**	**2**	VaxGen, 2003	**2**	vCP 1521/ gp120 B/E Merck Ad5
All Interventions	**I or CRCT**	**4**	**23**		1 8	

Summary: Biomedical HIV prevention interventions that work

Intervention	Individual level or community RCT	Comment
Male Circumcision	3 IRCTs	Compelling evidence Modelling suggests likely to be population level impact.
Condoms Male & Female	X	No RCT Accepted on the basis of the “natural experiment’
STI treatment	0 (I) IRCT 1 (4) CRCT	No population-level effect on HIV in a mature epidemic; Important for STI care
PMTCT	IRCTs	Transmission risk decreases with increased no. of drugs

Source: Delany-Moretlwe (2009)

3.2. Accelerating behavioural HIV prevention interventions that work

Behavioural HIV prevention strategies are those that attempt to:

- Delay first intercourse,
- Reduce number of sexual partners,
- Increase the number of sexual acts that are protected,
- Provide HIV counseling and testing and access to treatment for those who are infected with HIV,
- Provide access to male circumcision,
- Decrease sharing of needles and syringes, and decrease substance abuse.

3.2.1. Increasing knowledge about HIV and AIDS

- Countries which signed the 2001 UNGASS document, pledged to ensure that 95% of young people aged 15 to 24 have accurate and complete knowledge of HIV by 2010.
- In 2007, national surveys found that 40% of young men and 36% of young women had accurate knowledge of HIV, as measured by surveys based on five HIV-related questions.
- 80% of young men and women are aware that being in a monogamous relationship with a person of the same sero-status is an effective prevention strategy. 70% of countries have implemented school-based HIV education
- However, knowledge does not automatically translate into behaviour change

3.2.2. Age of sexual debut

- In most African countries, the percentage of young people having sex before age 15 is decreasing - a continuation of trends detected earlier this decade.
- Between 1998 and 2007, the share of young people globally reporting sexual intercourse before age 15 fell from 14% to 12%.
- In sub-Saharan Africa, adolescent girls under 15 are almost 50% more likely than boys to be sexually active

3.2.3. Condom use

- In most African countries, fewer than 50% of sexually active young people report having used a condom the last time they had sex
- The **female condom** is 94-97% effective in reducing the risk of HIV infection if used correctly and consistently
- When **male condoms** are used correctly and consistently, they are **80-95% effective** in reducing the risk of HIV infection
- A meta-analysis of 62 well-designed evaluation studies (44 from sub-Saharan Africa) found that behavioural models targeting sex workers significantly increased condom use with clients, although these programmes had only limited impact on condom use with casual partners[1]

[1] Foss (2007)

Summary: Behavioural HIV prevention interventions that work

Intervention	Individual level or community RCT	Comment
Behavioural		
Behavior change (abstinence/delay sex, sexual partner reduction, condom use)	0 IRCT 0 CRCT [Stepping stones]	•Pending trials e.g. Project Accept on VCT •Methodological challenges in measuring impact on HIV incidence; impact on intermediate factors observed in some trials e.g. Stepping stones •Emphasis on self-reported outcomes

Source: Delany-Moretlwe (2009)

3.3. Accelerating structural HIV prevention interventions that work

3.3.1. HIV Testing and Counseling (HTC)

- A systematic review of the impact of VCT in developing contexts shows that evidence exists for VCT as an effective behaviour change strategy
- VCT is most effective in promoting behaviour change (i.e. reports of less unprotected sex, fewer multiple sex partners and casual partners) between couples tested together and among HIV positive individuals, particularly with their non primary partners.

- The efficacy of VCT as a primary prevention strategy for HIV-negative people, as well as the long term effects of VCT for HIV negative and HIV positive individuals is less certain
- VCT assists people to cope with a range of PSS problems associated with an HIV-positive diagnosis

- Results from sub-Saharan Africa reveal that high-quality VCT is an effective strategy for reducing HIV sexual risk behaviours among adults

3.3.2. Community structures, systems and micro-finance

- There is increasing evidence that different kinds of community structures and systems make populations more or less vulnerable to HIV/AIDS, independent of exposure to HIV prevention interventions and relative wealth.
- A study in Zimbabwe of over 2000 women aged 15–24 years found that membership of groups that were poorly functioning community groups was associated with increased rates of HIV infection, while membership of well-functioning groups was associated with reduced rates.
- A community RCT conducted by RADAR on microfinance obtained similar findings as the Zim study.

3.3.3. Health and human rights approach

- Research presented at the AIDS 2008 conference showed that there has been mixed results in this regard.
- On the one hand, research identified a range of rights-based programmes currently in use. For example, Patel described an ambitious attempt in Africa to intervene in legal proceedings using an impact litigation framework

Case study 2: The Ntwenge Initiative

In 2006, Ntwenge, an NGO in Zimbabwe, began a process of participatory research and advocacy to identify the factors that limit women and girls from realizing property and inheritance rights. It subsequently trained women and girls as educators to deliver community legal workshops and monitor observance of property and inheritance rights. Some 385 cases have since been handled resulting in 600 widows and families regaining their inheritance.

Summary: Structural interventions that work

Intervention	Individual level or community RCT	Comment
Microfinance	0 (1) CRCT	Methodological challenges Impact on other intermediate factors

Source: Delany-Moretlwe (2009)

4. HIV prevention interventions that work

HIV prevention interventions that work, include:

- adult male circumcision;
- condom access and use;
- treatment of STIs;
- prevention of mother-to-child transmission
- ART
- ?Voluntary counseling and testing

4. Effective HIV prevention interventions:

- …involve the simultaneous use of diverse prevention strategies = Combination prevention
- …must achieve sufficient coverage, intensity, and duration to have optimal public health impact
- …affect knowledge, attitudes, practices and behaviours (KAPB)
- …address the social dynamics that influence individual behaviour (change social norms).
- …ensure access to HIV prevention technologies and tools
- …are specific to the geographic and social context in which risk behaviour occurs.

Global HIV Prevention Working Group (2008). Behaviour change and HIV prevention: (Re)considerations for the 21st century

5. Challenges with implementing HIV prevention interventions that work

- Challenges related to systems which deter individuals from seeking essential preventive services:
  - Inadequate financing,
  - misallocation of resources,
  - capacity limitations,
  - service fragmentation, and
  - stigma and discrimination

- Socio-economic challenges which deter individuals from seeking essential preventive services:
  - Social and cultural factors,
  - Economic factors,
  - Political factors,
  - Legal factors

6. Proposed targets for implementing HIV prevention interventions for the NSP

	Interventions	2009	2010
Develop behaviour change interventions for the prevention of sexual transmission of HIV, adapted to different target groups	Interventions aiming to reduce risky sexual behaviours	Applied to 3 sites per province = 27	Applied to 6 sites per province = 54 sites
	Intervention aiming to reduce drug use (eg Mandrax, cocaine,crack, tick, heroine)	Applied to 3 sites per province = 27	Applied to 6 sites per province = 54 sites
	Theory-based interventions to reduce alcohol abuse	Applied to 3 sites per province = 27	Applied to 6 sites per province = 54 sites
	Total sites	**81 sites**	**180**

Conclusion

- We have made serious progress in developing evidence-based HIV prevention strategies and in mobilizing resources for responding to the epidemic. However, the HIV epidemic remains obstinate
- We now require serious commitment and leadership to implement combination prevention interventions which include context-specific, evidence-based interventions.
- Important gaps and limitations remain in our knowledge about what works in HIV prevention. Accelerating HIV prevention requires that these limitations be acknowledged and addressed.