CENTRE FOR EVALUATION RETREAT
10 November :: 9am – 5:30pm :: Prospero House, Borough

An exciting programme of internal & external speakers with interactive sessions on topics including:

• The role of evaluation in policy development
• Assessing context and its influence on outcomes
• Opportunistic evaluations of programmes and systems

Register at https://evaluationretreat2016.eventbrite.co.uk

CfE ANNUAL GENERAL MEETING
11 November :: 10am – 1pm :: Tavistock Place, JM A&B

• Contribute to the running and strategy of the CfE
• Discuss plans for the coming year

All Centre for Evaluation members welcome!
To join the CfE email: evaluation@lshtm.ac.uk
The HIV prevention cascade

James Hargreaves
COMMENT

We neglect primary HIV prevention at our peril
Michael T Isbell, Ndiku Kilonzo, Owen Mugurungi, Linda-Gail Bekker
Open Access
Full-Text HTML | PDF

The HIV prevention cascade: more smoke than thunder?
Peter Godfrey-Faussett
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ARTICLES

Maximising HIV prevention by balancing the opportunities of today with the promises of tomorrow: a modelling study
Jennifer A Smith, Sarah-Jane Anderson, Kate L Harris, Jessica B McGillen, Edward Lee, Geoff P Garnett, Timothy B Hallett
Open Access
Full-Text HTML | PDF

Providing a conceptual framework for HIV prevention cascades and assessing feasibility of empirical measurement with data from east Zimbabwe: a case study
Geoffrey P Garnett, Timothy B Hallett, Albert Takarua, James Hargreaves, Rebecca Rhead, Mitchel Warren, Constance Nyamukapa, Simon Gregson
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Interventions to strengthen the HIV prevention cascade: a systematic review of reviews
Shari Krishnaratne, Bernadette Hensen, Jillian Cordes, Joanne Enstone, James R Hargreaves
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PERSONAL VIEW

The HIV prevention cascade: integrating theories of epidemiological, behavioural, and social science into programme design and monitoring
James R Hargreaves, Sinead Delany-Moretwe, Timothy B Hallett, Saul Johnson, Saidi Kapiga, Parinita Bhattacharjee, Gina Dallabetta, Geoff P Garnett
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HIV Prevention 2020: a framework for delivery and a call for action
Karl L Dehne, Gina Dallabetta, David Wilson, Geoff P Garnett, Marie Laga, Elizabeth Benomar, Ade Fakoya, Rachel C Baggaley, Lisa J Nelson, Susan Kasedde, Alhoro Bermejo, Mitchel Warren, Clemens Benedikt, Global Prevention Focal Point Group
Full-Text HTML | PDF
• Where are we with HIV prevention?
  – Trends and patterns in HIV incidence (UNAIDS)
  – Available and future “direct mechanisms” of HIV prevention (Smith)
  – HIV Prevention 2020 (Dehne)
  – Critique of combination prevention (Garnett, Hargreaves)

• The HIV prevention cascade
  – As a framework for measurement and monitoring (Garnett)
  – As a framework for interventions and programmes (Hargreaves, Krishnaratne)
  – Critique of the prevention cascade (Godfrey-Faussett)

• Next steps, discussion
HIV Incidence
Distribution of new HIV infections among population groups, by region, 2014

Source: UNAIDS special analysis, 2016.
Methodological note: Estimated numbers of new HIV infections by key population were compiled from country Spectrum files submitted in 2013 to UNAIDS (2014 data), available modes-of-transmission studies and additional sources of data drawn from GARDE reports. Where data were lacking, regional medians were calculated from available data and applied to countries’ populations.
“Direct mechanisms” of HIV prevention: opportunities of today and promises of tomorrow
<table>
<thead>
<tr>
<th></th>
<th>Efficacy</th>
<th>Available</th>
<th>Priority risk group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condoms</td>
<td>90%</td>
<td>Now</td>
<td>FSW</td>
</tr>
<tr>
<td>VMMMC</td>
<td>60%</td>
<td>Now</td>
<td>Young men</td>
</tr>
<tr>
<td>Early ART</td>
<td>85%</td>
<td>Now</td>
<td>All</td>
</tr>
<tr>
<td>Oral PrEP</td>
<td>90%</td>
<td>Now</td>
<td>FSW, high-risk young women</td>
</tr>
<tr>
<td>IVR</td>
<td>65%</td>
<td>2017</td>
<td>FSW</td>
</tr>
<tr>
<td>LA-ARVs</td>
<td>90%</td>
<td>2020</td>
<td>FSW, high-risk young women</td>
</tr>
<tr>
<td>BNAbs</td>
<td>90%</td>
<td>2028</td>
<td>FSW, high-risk young women</td>
</tr>
<tr>
<td>Imperfect vaccine</td>
<td>50%</td>
<td>2024</td>
<td>14 year-olds</td>
</tr>
<tr>
<td>Idealised vaccine</td>
<td>70%</td>
<td>2030</td>
<td>14 year-olds</td>
</tr>
</tbody>
</table>
Less emphasis on future long-acting products

Existing interventions and IVR prioritised

Condoms, oral PrEP and vaccine consistent with current programmatic aims
“A strategic approach in which limited resources are used to maximise prevention effect would focus on strengthening the scale-up of existing interventions, while urgently pursuing a workable vaccine and developing other approaches that can be used if increasing use of existing interventions is limited.”
HIV Prevention 2020: a framework for delivery and a call for action

Karl L Dehne, Gina Dallabetta, David Wilson, Geoff P Garnett, Marie Laga, Elizabeth Benomar, Ade Fakoya, Rachel C Baggaley, Lisa J Nelson, Susan Kasedde, Alvaro Bermejo, Mitchell Warren, Clemens Benedikt, Global Prevention Focal Point Group

Reduce new infections to 500,000 by 2020
(by 75% compared with 2010)

90% of adolescents and adult women or men
High-incidence countries or settings

90% of key populations
(sex workers, men who have sex with men, transgender people, people who inject drugs)
All countries

90% condom use at high-risk sex (non-regular or paid partners)

90-90-90 for ART, 3 million on PrEP

90% of men aged 15–29 circumcised (14 priority countries)

90% use of NSP or OST (by people who inject drugs)

Packages

Condoms and safe behaviours
Antiretroviral based prevention
Voluntary medical male circumcision
Harm reduction

Outputs (country-specific targets)

Demand
Communications, service delivery and supplies, community outreach

Deliver

Adhere

Service delivery platforms for scale
Health services, schools, community-based organisations

Enablers and synergies
Sexual and reproductive health, community engagement, economic empowerment, gender norms, legal environment

Clients: Choice
Programmes: Speed, Scale, Quality, Sustainability
Management: Global, national, local accountability
Critique of combination prevention
Critique of combination prevention

- Biomedical, behavioural and structural interventions seen as separate, or even competing

- Over-optimism about biomedical products
  - But converting efficacy to impact requires coverage which requires use

- Pessimism about some types of behavioural interventions
  - (Over?) ambitious impact trials in the past
  - Perceived weakness in not addressing social determinants

- Confusion about structural interventions
  - What, how effective, who should do them, who should pay for them ...
The HIV prevention cascade
The basic idea ...

• To halt the spread of HIV requires that efficacious treatment and preventive products or behaviours ("direct mechanisms") are used by those at risk
• Far from being separate, it is "behavioural" and "structural" actions that will be essential to achieve increased coverage
• "Treatment cascade" analyses defining the "steps" needed to prevent death among those infected have been a useful tool
• For a particular prevention "direct mechanism", for a particular target population, can conceive of analogous "steps" (not all relevant to all situations) to prevent infection
  • Demand for direct mechanisms (risk perception, awareness, acceptability)
  • Have access to products / procedures (available, affordable)
  • Adhere over time to the direct mechanism
  • Efficacy of the direct mechanism
Intervention-centric

Circumcision prevalence: 3.1%
Number of infections prevented: 16.3 per 1000

2009-11

Negligible availability of circumcision services

2012-13

Circumcision prevalence: 6.9%
Number of infections prevented: 22.8 per 1000

0.02% reduction in HIV incidence attributable to VMMC programme

VMMC available to one-third of population but low uptake among men who knew that services were available locally

At risk

Efficacious

Adhere

Take up product

Supplied product

Lack of availability (20 km)

Lack of uptake

Lack of efficacy

Infections prevented
• Relevance to interventions: Is the cascade an **integrating framework**?
Figure: Targets for prevention programmes along the HIV prevention cascade
Prevention targets with some examples of interventions, platforms for delivery, and policies.

The HIV prevention cascade: integrating theories of epidemiological, behavioural, and social science into programme design and monitoring

James R Hargreaves, Sinead Delany-Moretlwe, Timothy B Hallett, Saul Johnson, Saidi Kapiga, Parinita Bhattacharjee, Gina Dallabetta, Geoff P Garnett
Figure 3. Mapping the evidence for the HIV prevention cascade

“Direct mechanisms”: 29 Reviews (98 primary studies [34 RCTs])
Prevention products: PreP (6), Condoms (4), VMMC (64), STI reduction (7), Microbicides (12), Vaccines (5)
Prevention behaviours: abstinence, sero-sorting (not included in this review)

“Demand” focused interventions: 40 Reviews (108 primary studies [24 RCTs])
IEC approaches (54); Peer-based approaches (54)

“Supply” interventions: 12 Reviews (35 primary studies [6 RCTs])
Mass Condom Distribution and associated policies (20); Needle / Syringe programmes and associated policies (6); Health system policies: Integration of family planning and HIV (6); STI Control (3)

“Use” interventions: 16 Reviews (51 primary studies [26 RCTs])
Counselling approaches (40); Social determinants approaches: cash transfers (3); microfinance (8)
<table>
<thead>
<tr>
<th>Demand-side interventions</th>
<th>Incidence</th>
<th>Prevalence</th>
<th>Condom use</th>
<th>HIV testing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of studies</td>
<td>Quality assessment rating</td>
<td>Number of studies</td>
<td>Quality assessment rating</td>
</tr>
<tr>
<td>Effect of IEC interventions focused on young people(^{2,31})</td>
<td>3 (1)</td>
<td>B4</td>
<td>1 (1)</td>
<td>B4</td>
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<tr>
<td>Effect of IEC interventions focused on men(^{2,31,25-27})</td>
<td>--</td>
<td>--</td>
<td>9 (3)</td>
<td>A2</td>
</tr>
<tr>
<td>Effect of IEC interventions focused on women(^{2,23})</td>
<td>--</td>
<td>--</td>
<td>2 (2)</td>
<td>B3</td>
</tr>
<tr>
<td>Effect of IEC interventions using mass media(^{2,24,26})</td>
<td>1 (1)</td>
<td>B3</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Effect of IEC interventions focused on people who use drugs(^{2,25-28,32})</td>
<td>--</td>
<td>--</td>
<td>4 (3)</td>
<td>A1</td>
</tr>
<tr>
<td>Effect of peer-based interventions focused on young people(^{2,31,25,26,28,30,32,41})</td>
<td>1 (1)</td>
<td>B4</td>
<td>--</td>
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<tr>
<td>Effect of peer-based interventions focused on MSM(^{2,26})</td>
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<td>3 (1)</td>
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<tr>
<td>Effect of peer-based interventions focused on female sex workers(^{2,23,24,25-26,34})</td>
<td>3 (1)</td>
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<td>4 (0)</td>
<td>C4</td>
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<tr>
<td>Effect of peer-based interventions focused on people who use drugs or alcohol(^{2,23,24,26,40})</td>
<td>2 (2)</td>
<td>B4</td>
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<tr>
<td>Effect of peer-based interventions with no population focus(^{2,23,24,25-26,34,43})</td>
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<table>
<thead>
<tr>
<th>Supply-side interventions</th>
<th>Incidence</th>
<th>Prevalence</th>
<th>Condom use</th>
<th>HIV testing</th>
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<tbody>
<tr>
<td></td>
<td>Number of studies</td>
<td>Quality assessment rating</td>
<td>Number of studies</td>
<td>Quality assessment rating</td>
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<tr>
<td>Effect of interventions that integrate HIV services into routine care(^{2,43})</td>
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<tr>
<td>Effect of clean needle or syringe programmes(^{2,26})</td>
<td>2 (3)</td>
<td>C3</td>
<td>6 (0)</td>
<td>C1</td>
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<td>Effect of condom distribution interventions(^{2,31,35,40,41})</td>
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<td>3 (0)</td>
<td>C1</td>
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<td>Effect of community-level STI interventions(^{33})</td>
<td>3 (3)</td>
<td>A4</td>
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<table>
<thead>
<tr>
<th>Adherence interventions</th>
<th>Incidence</th>
<th>Prevalence</th>
<th>Condom use</th>
<th>HIV testing</th>
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<tbody>
<tr>
<td></td>
<td>Number of studies</td>
<td>Quality assessment rating</td>
<td>Number of studies</td>
<td>Quality assessment rating</td>
</tr>
<tr>
<td>Effect of couples-based counselling(^{2,4,47})</td>
<td>1 (0)</td>
<td>C1</td>
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<tr>
<td>Effect of HIV testing and counselling(^{2,31,24,43})</td>
<td>1 (1)</td>
<td>B4</td>
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<td>--</td>
</tr>
<tr>
<td>Effect of individual-level counselling(^{2,24,25-26,34})</td>
<td>1 (1)</td>
<td>B3</td>
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<tr>
<td>Effect of HIV-positive prevention counselling(^{2,24,25-26,34})</td>
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<td>--</td>
<td>7 (4)</td>
<td>A3</td>
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<tr>
<td>Effect of microfinance interventions(^{2,46})</td>
<td>1 (1)</td>
<td>B4</td>
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<tr>
<td>Effect of cash transfer interventions(^{51})</td>
<td>2 (2)</td>
<td>B4</td>
<td>2 (2)</td>
<td>B1</td>
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<table>
<thead>
<tr>
<th>Direct mechanisms</th>
<th>Incidence</th>
<th>Prevalence</th>
<th>Condom use</th>
<th>HIV testing</th>
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<td></td>
<td>Number of studies</td>
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<td>Number of studies</td>
<td>Quality assessment rating</td>
</tr>
<tr>
<td>Medical male circumcision for heterosexual route risk (female to male)(^{2,4,29})</td>
<td>38 (3)</td>
<td>A1</td>
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<tr>
<td>Medical male circumcision for heterosexual route risk (male to female)(^{2,31})</td>
<td>7 (1)</td>
<td>B3</td>
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<tr>
<td>Male circumcision men who have sex with men route individual-level studies(^{2,5,29})</td>
<td>19 (0)</td>
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<tr>
<td>Condoms (heterosexual) individual-level studies(^{2,30})</td>
<td>4 (0)</td>
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<td>Oral PrEP (overall) individual-level studies(^{2,30})</td>
<td>6 (6)</td>
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<td>Microbicide prophylaxis individual-level studies(^{2,30})</td>
<td>12 (12)</td>
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<tr>
<td>STI treatment individual-level studies(^{2,30})</td>
<td>7 (7)</td>
<td>A4</td>
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<tr>
<td>HIV vaccine individual-level studies(^{3,50})</td>
<td>5 (5)</td>
<td>A3</td>
<td>--</td>
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<table>
<thead>
<tr>
<th>3 or more RCTs (might also include observational studies)</th>
<th>1-2 RCTs (might also include observational studies)</th>
<th>No RCTs; only observational studies</th>
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<tbody>
<tr>
<td>Consistently showed effectiveness</td>
<td>Consistently showed effectiveness</td>
<td></td>
</tr>
<tr>
<td>Largely, but not consistently, showed effectiveness</td>
<td>Consistently showed effectiveness</td>
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<tr>
<td>Mixture of beneficial and ineffective or harmful results</td>
<td>Consistently showed effectiveness</td>
<td></td>
</tr>
<tr>
<td>Consistent ineffective or harmful results</td>
<td>Consistently showed effectiveness</td>
<td></td>
</tr>
</tbody>
</table>
Summary

• Primary HIV prevention remains an urgent priority
• We have more “direct mechanisms” of HIV prevention available now than ever before
  – Including behaviours, products and procedures, and more on the way
• Converting the efficacy of these direct mechanisms into population impact requires interventions that increase their coverage, by
  – Improving demand, through interventions drawing on behavioural theory
  – Improving supply, through programmes and policies that improve availability and accessibility
  – Supporting adherence over time, through behavioural interventions targeting self-efficacy, skills and addressing barriers and incentives
PGF’s critique

• He doesn’t think cascade is the right word, “more like a web” (in the paper) or a “mosaic” (pers. comm)
• While people who need treatment essentially need the same thing, prevention needs are heterogenous
  – both because of the different choices people might make and because of huge heterogeneity in risk of becoming infected among uninfected populations
• It over-simplifies prevention
• It obscures externalities (eg keeping girls in school has benefits to other sectors)
What next?
• The MeSH Consortium
  – Work stream on prevention cascade measurement

• WHO, UNAIDS, country guidance and targets
  – Commissioning work to bring prevention into the Strategic Information Guidance Cascade, for
  – Need for coverage indicators to be specified

• Are the ideas useful to major prevention initiatives?
  – DREAMS (young women), Linkages (key populations)

• Does it imply an intervention / implementation research agenda on demand, supply and adherence?

• World AIDS Conference examples ...

• Hopefully, the series will inspire HIV prevention thinking and action!
Thanks