Crowdsourcing to spur HIV testing: Online platforms learning from and sharing with communities

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Above: Foldit game (Cooper et al., Nature, 2010)
Below: Crowdsourced logo (IAS 2014)
COI

• Advisor to SESH Global, a Chinese social enterprise using crowdsourcing to improve health

• No support from pharmaceutical companies
Hong Kong Challenge: Height (in meters) of the Buddha?
Key Points

1) Crowdsourcing has a group *solve* a problem, then *shares* the solution with the community
2) Public innovation challenge contests (contests) can *engage communities at scale*
3) Evidence *shows* that contest approaches *create useful images, logos, and campaigns*
4) Contests have already been used to *help inform national and global HIV policy*
Crowdsourcing Defined

Crowdsourcing has a group solve a problem, then shares the solution widely with the public\(^1\)

**Examples:**
- Wikipedia
- Oxford English Dictionary
- Prostate Challenge DREAM Community\(^2\)

\(^1\) Henk van Ess, “Crowdsourcing: how to find a crowd” (Presented at ARD/ZDF Academy in Germany)

\(^2\) Guinney et al., Lancet Oncology, 2017, PMC5217180

Why crowdsourcing to improve health?

1) Existing online networks
2) Insights from many fields about group genius
3) Big data, small analysis power

Social media crowdsourcing via Twitter
Source: www.clickworker.com
### Crowdsourcing

**Key Elements**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity of opinion</td>
<td>Each person should have private information even if it's just an eccentric interpretation of the known facts.</td>
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<tr>
<td>Independence</td>
<td>People's opinions aren't determined by the opinions of those around them.</td>
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<tr>
<td>Decentralization</td>
<td>People are able to specialize and draw on local knowledge.</td>
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<tr>
<td>Aggregation</td>
<td>Some mechanism exists for turning private judgments into a collective decision.</td>
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Source: *Wisdom of Crowds*, Surowiecki J, Doubleday, 2005

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1. Solve/share with community
2. Engage community
3. Show evidence
4. Help inform policy

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Eight Immortals Crossing the Sea
Crowdsourcing Contest Stages

1. Solve/share with community
2. Engage community
3. Show evidence
4. Help inform policy

- **ORGANIZE A COMMUNITY STEERING GROUP**
  - Strong community buy-in from the start, resonates with local language/culture/preferences

- **ENGAGE COMMUNITY TO CONTRIBUTE**
  - Clarify the contest for community members, provide feedback on entries
  - Social media and in-person events at local communities

- **EVALUATE CONTRIBUTIONS**
  - Crowd, steering committee, or others evaluate entries based on pre-specified criteria
  - Narrows the field of entries, relies on local judgement, taps crowd wisdom
  - Social media and in-person announcement of finalists

- **RECOGNIZE FINALISTS**
  - Incentives for finalists and also for participation in the contest

- **SHARE SOLUTIONS AND IMPLEMENT**
  - Real word implementation and evaluation
  - Share finalists with national or local agencies, implement the finalists within communities

*Entries can be short texts (concepts), images, or videos. They can describe patient perspectives, novel pilots, programs, or local policies.*
**Foldit contest**

- Gamification to predict protein structure
- Crowd teams better than best algorithm
- 460,000 participants
- *Nature* paper with 57,000 co-authors

Cooper et al., *Nature*, 2010
Script writing contest in Africa

- Young people in Africa invited to write scripts for short films on HIV
- 63,000 entries from 25 African countries
- Ultimately 39 short films, translated into 30 languages
- Viewed by 55M individuals

Contest winner from Zambia
Source: Global Dialogues, 2017

Beres et al., Glob Public Health, 2013
Crowdsourcing contests versus social marketing approaches to creating an HIV test promotion video

**Crowdsourcing contest approach**

**Open Call**
Anyone can submit an idea (experts and non-experts, youth, creatives, amateurs)

**Collaborate & Engage**
Members of the community work alone or together to develop their idea further

**Judge**
Crowd members and/or a panel judge submissions to the challenge

**Share**
Recognize finalists and share submissions widely

**Social marketing approach**

**Closed Call**
Experts or private companies respond to RFA (request for proposals)

**Experts Develop**
Experts identify other individuals to refine and extend the new idea

**Experts Judge**
Experts evaluate the overall approach, with limited key pop input

**Implement**
Less of a focus on implementation

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02/06/2017
Pragmatic RCT: Online MSM/TG across China

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- Included online Chinese MSM who never HIV tested
- Primary outcome: HIV test uptake and results
- Men assigned to crowdsourced video or health marketing video
- Non-inferiority design
- Registered (NCT 02248558)

Tang, Han, Best et al., Clin Infect Dis, 2016
Evidence to Support Contests

- 2 RCTs (NCT02248558 NCT02516930) demonstrate effectiveness and cost savings of crowdsourcing contests$^1,^2$

- 8 city stepped wedge trial underway now in China

- Qualitative and quantitative (discrete choice experiment) data revealing preferences for crowdsourced messages$^3$

$^1$Tang, Han, Best et al., CID, 2016
$^2$Tang et al., Lancet, 2016; Liu et al., BMJ Open, 2016
$^3$Ong et al., STD In Press; Zhang et al., BMC Public Health, 2017
What is sex?

In the crowded sea of people, We got to know each other, Then we knew ourselves, And finally I knew myself, Sex is understanding.

Sex is risky, but condoms can avoid [the risk], Sex is a choice.

Sex is satisfaction.

Adam and Eve ate the forbidden fruit and only then came you and me. Sex is instinct.
DREAMS Innovation Challenge

- Solicited ideas to reduce HIV infection among adolescents and girls in Africa
- 684 participants, 55 winners
- 60% small community organizations
- 85M in seed money from PEPFAR and partners

Above: Call for entries, Mt. Kenya Times
Below: Winners from Malawi (US Embassy in Malawi)
CrowdOutAIDS

• Open contest to solicit youth input on UNAIDS strategy
• Wiki-like platform allowed online and in-person submissions
• 5000 youth from 79 countries participated
• Final recommendations informed UNAIDS Youth Programme

Upper right: Map of online and in-person forums
Lower right: Crowdsourced strategy presented to UNAIDS Director

02/06/2017
SESH Global

• Focused on research and based in Guangzhou, China
• Launched in 2012 by our interdisciplinary group (www.seshglobal.org)
• Mission: Use crowdsourcing to create more engaging and effective health services
• Projects initially in China and Hong Kong, now in the US, Australia, Vietnam, Malawi, Uganda, Philippines, Columbia, and globally
• Including all key populations

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Limitations of Crowdsourcing Health

• Crowdsourcing is not a panacea
• Online crowd *evaluation* may become popularity contests
• Variability in the quantity of contest engagement
## Moving Forward: HIV Contests

<table>
<thead>
<tr>
<th>Potential HIV Contest Organizer</th>
<th>HIV Contest Example</th>
<th>References</th>
</tr>
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<tbody>
<tr>
<td>Data people (surveillance, researchers)</td>
<td>Organize an innovation challenge to share data toward a community goal (improved clinical algorithm, local solution)</td>
<td><em>NEJM</em> Sprint Challenge; Guinney et al., <em>Lancet Oncology</em>, 2017, PMC5217180;</td>
</tr>
<tr>
<td>Community advocates (CBO leaders, civil society)</td>
<td>Logo contest to create a brand for a new HIV testing campaign</td>
<td>Ong et al., <em>STD</em>, in press</td>
</tr>
<tr>
<td>Clinical doctors</td>
<td>Image contest to increase key population demand for HIVST, PrEP, other HIV services</td>
<td>Zhang et al., <em>STD</em>, 2015; Tang et al., <em>CID</em>, 2016</td>
</tr>
<tr>
<td>Policy/program managers</td>
<td>Open call for HIV innovative case studies to inform policy</td>
<td>2017 WHO Hepatitis Guidelines</td>
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Key Points

1) Crowdsourcing has a group solve a problem, then shares the solution with the community
2) Public innovation challenge contests (contests) can engage communities at scale
3) Evidence shows that contest approaches create useful images, logos, and campaigns
4) Contests have already been used to help inform national and global HIV policy
Thank You  多謝

SESH website: www.seshglobal.org
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