Drinking from a firehose: The communication of science and risk during a pan- and infodemic

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Five Key takeaways
#1

**Proliferation of Platforms and (Mis)information**
Features of the communication revolution

- Proliferation of information platforms
  - Generation and delivery
- Generation of an enormous amount of data from different sources
- Networked environment
Internet Usage, 2005-2019

Individuals using the Internet, 2005-2019*

Note: * ITU estimate
Source: ITU.
SOCIAL MEDIA USE AROUND THE WORLD

BASED ON THE NUMBER OF MONTHLY ACTIVE USERS OF TOP SOCIAL MEDIA PLATFORMS IN EACH COUNTRY OR TERRITORY

TOTAL NUMBER OF ACTIVE SOCIAL MEDIA USERS: 3.80 BILLION

SOCIAL MEDIA PENETRATION (USERS vs. TOTAL POPULATION*): 49%

ANNUAL GROWTH IN THE TOTAL NUMBER OF SOCIAL MEDIA USERS: +9.2%

TOTAL NUMBER OF SOCIAL MEDIA USERS ACCESSING VIA MOBILE PHONES: 3.75 BILLION

PERCENTAGE OF TOTAL SOCIAL MEDIA USERS ACCESSING VIA MOBILE: 99%

SOURCES: KEPES ANALYSIS, COMPANY STATEMENTS AND EARNINGS ANNOUNCEMENTS, SOCIAL MEDIA PLATFORMS' SELF-SERVICE, ADVERTISING TOOLS, MEDiasmart, CAPTABAZAR (ALL DATA AVAILABLE IN JANUARY 2020). *NOTES: PENETRATION FIGURES ARE FOR TOTAL POPULATION, REGARDLESS OF AGE. + COMPATIBILITY ADVICE: SOURCE AND BASE CHANGED.
DATA NEVER SLEEPS 6.0

How much data is generated every minute?

The amount of data generated in 2018 is staggering, but the trend of data generation is only increasing. By 2020, it is estimated that 2.7 zettabytes of data will be created every day, with 1.7 of that data being created at some point in the day. The ability to make data-driven decisions is crucial to any business. With the rise of big data, the amount of information created daily has increased exponentially. Data-driven decisions are becoming increasingly important in today's world.
Use COVID-19 filters from PubMed Clinical Queries to refine your search
- Treatment
- Mechanism
- Transmission
- More filters

See more SARS-CoV-2 literature, sequence, and clinical content from NCBI

Resolution of coronavirus disease 2019 (COVID-19)
Two key features of this data deluge

- Information Deluge.....
- Limited or no gatekeeping
#2

The Production of health, science and risk information: Who generates it?
Who generates risk “information”? 

Scientists provide the science, but..

- Mass Media
- Health systems
- Private Sector
- Activists Groups
- User-generated content
Individuals as information producers in the age of social media

• Penetration of Social Media and apps has allowed individuals to
  – Produce information
  – Disseminate information
  – Network effect
#3

Information ≠ Communication
Distinguish

• Information
• Misinformation
• Disinformation
Incredible world: unscrupulous and in-humane leaders who engineer a killer virus to wipe out innocents—whether in enemy nation or their own
Nearly half of some 200 million tweets about COVID-19 likely came from bots, with many of them peddling false cures, peddling conspiracy theories and clamoring for the U.S. to drop safety measures in order to re-open America, researchers have found.
Consumption of Health Information

- Flood of health information is overwhelming
- Culture of science and culture of communication
  - Episodic
  - Seemingly contradictory and conflicting
  - “they can’t make up their mind”
- Innumeracy, healthy literacy and low “research literacy”
<table>
<thead>
<tr>
<th>COVID-19 Knowledge</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Knowledge</td>
<td>Staying home as much as I can</td>
</tr>
<tr>
<td>High Knowledge</td>
<td>1 [Reference]</td>
</tr>
<tr>
<td></td>
<td>4.06 (2.54–6.48)</td>
</tr>
<tr>
<td>Low Knowledge</td>
<td>Keeping a safe physical distance</td>
</tr>
<tr>
<td>High Knowledge</td>
<td>1 [Reference]</td>
</tr>
<tr>
<td></td>
<td>5.07 (2.8–9.17)</td>
</tr>
<tr>
<td>Low Knowledge</td>
<td>Washing my hands often</td>
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<tr>
<td>High Knowledge</td>
<td>1 [Reference]</td>
</tr>
<tr>
<td></td>
<td>4.63 (2.3–9.3)</td>
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<tr>
<td>Low Knowledge</td>
<td>Using face masks</td>
</tr>
<tr>
<td>High Knowledge</td>
<td>1 [Reference]</td>
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<tr>
<td></td>
<td>10.41 (5.72–18.96)</td>
</tr>
<tr>
<td>Low Knowledge</td>
<td>Cleaning surfaces touched frequently</td>
</tr>
<tr>
<td>High Knowledge</td>
<td>1 [Reference]</td>
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<tr>
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<td>3.74 (2.33–5.98)</td>
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<tr>
<td>Low Knowledge</td>
<td>COVID-19 prevention Self-Efficacy</td>
</tr>
<tr>
<td>High Knowledge</td>
<td>1 [Reference]</td>
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<tr>
<td></td>
<td>3.5 (2.38–5.14)</td>
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#4

Health & Communication Inequalities
Health Inequalities

• Health, like wealth, is unequal
  – People from higher SEP, and those living in wealthy neighborhoods/cities are healthier
  – Mortality is distributed unequally across social groups
  – Risk factors are unequally distributed
    • More prevalent among low SEP
  – Poverty has pernicious effect on wellbeing
    • Leads to isolation, disconnectedness, lack of access to health services, less access to telecommunication services, more unhealthy behaviors
• **Communication inequalities** manifest at multiple levels
  
  – **Macro-Level**: Differences in generation, processing and distribution of health information between different groups and institutions
  
  – **Individual-Level**: Differences in accessing, processing and using health information → precluding certain groups from taking advantage of the information revolution
Inequalities in health and well-being outcomes

Levels of Influence on Health and Well-being
- Culture
- Policy
- Community, Organizations
- Social Networks
- Individual

Dimensions of Communication Inequalities
- Engagement
- Access
- Processing
- Ability to Act

Health Outcomes
- Inequalities in health and well-being outcomes
Social Determinants and Science Communication

- What matters
  - Class matters
  - Race (& ethnicity) matters
  - Place matters
  - Policy matters
- Data Absenteeism

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Mean</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>U.S. adults</td>
<td>6.7</td>
<td></td>
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<tr>
<td>Postgrad</td>
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<tr>
<td>College grad</td>
<td>8.5</td>
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<tr>
<td>Some college</td>
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<tr>
<td>H.S. or less</td>
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<table>
<thead>
<tr>
<th>Gender</th>
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<tbody>
<tr>
<td>Men</td>
<td>7.4</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>6.0</td>
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</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>White</td>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.1</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Whites and blacks include only non-Hispanics. Hispanics are of any race. All questions are multiple choice: for full question wording, see topline.
Source: Survey conducted Jan. 7-21, 2019. "What Americans Know About Science" PEW RESEARCH CENTER
### Among the college educated, whites score higher than blacks and Hispanics on science knowledge

*Mean number of correct answers out of 11*

<table>
<thead>
<tr>
<th></th>
<th>Among those with a college degree or more</th>
<th>Among those with some college education or less</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>9.3</td>
<td>6.7</td>
</tr>
<tr>
<td>Black</td>
<td>5.6</td>
<td>3.2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7.6</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Notes: Whites and blacks include only non-Hispanics. Hispanics are of any race. All questions are multiple choice; for full question wording, see topline.
Source: Survey conducted Jan. 7-21, 2019.
“What Americans Know About Science”

PEW RESEARCH CENTER
Information processing

• Mindset of resource scarcity
  – Differential allocation of attention
  – Pressing demands and juggling
  – Cognitive overload?

Consequences of inequalities

- Lower knowledge
- Norms conducive to unhealthy behaviors
- Limited or no access to services
- Inability to act on opportunities even when available
- Higher disease incidence, prevalence and even mortality
#5

What can be done?
Some solutions....

- Science of message construction
- Science of Engagement
- Participatory science
How you say it is as important as what you say
Message formats

- Several types of message formats ("construction")
  - Fear appeals
  - Sensation seeking
  - Narratives
  - Exemplars
  - Framing
Is Domestic Violence...

What is the message?

A women’s issue or... a community issue?

A private or a public health issue?

Reframing responsibility, changing norms.

http://www.ywcalawrence.org/programs/domestic_violence2.asp
http://www.bellbajao.org/

Bell Bajao - Global Champion
United Nations Secretary-General Ban Ki-moon joins Bell Bajao as the first global champion. He invites men all over the world to unite in stopping violence against women. ...
Engagement of stakeholders
COVID-19 Dashboard

Use our step-by-step approach
Find resources
Get help
Sign up for a training

Evidence-based programs for healthy communities

WHAT'S NEW

COVID-19 Dashboard

Given the global pandemic, there is an urgent need for reliable information that is technically and scientifically sound and easily understandable. It has become increasingly difficult to separate truth from fiction even though

“Planet MassCONECT gives you the tools to identify successful evidence-based programs [and] get immediate access to important data... I utilize the website regularly to research evidence-based programs that might work in my community.”

Rev. Albert Whitaker
NE Regional Director of Community Health Strategies, American Diabetes

VISWANATH LAB

HARVARD School of Public Health

DANA-FARBER CANCER INSTITUTE
Welcome to the site. The rapid spread of COVID-19 virus across the globe is affecting millions of people and is at the same time resulting in the spread of information, misinformation (false information spread without malicious intent) and disinformation (false information spread with the intent to deceive). Our intention is not to create additional information but to bring together credible COVID-19 related information that is easy to access, understand and act upon. Here, we try and address how to navigate the large amounts of information and will update this page as more evidence becomes available. Our target audiences are people we have been working with: journalists, non-governmental organizations and members of the communities we are engaging in. Others too may find this useful.

Over the next few weeks we will expand, modify and update this information. Please visit as often as you can and let us know how this site can be more helpful.
Participatory Science
Desideratum or even need of the hour....

Need a new approach that requires laser focus on the underserved, engages communities and where science communication is participatory.
Acknowledgements

- Ananya Awasthi
- Mesfin Bekalu
- Carmenza Bruff
- Meg Chau
- Dhriti Dhawan
- Ria Golecha
- Ananya Kumar
- Pavitra Madira
- Sitara Mahatani
- Aileen Maldonado-Campos
- Rachel McLoud
- Sara Minsky
- Ramya Pinnamaneni
- Manvi Poddar
- Marina Texeira
- Coralia Vazquez-Otero

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