Communication Inequalities and Communication of Science: In Three Acts

By

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Two major revolutions of the 21st century form a clear foreground to the theme of this meeting. One is the revolution in life sciences including biomedical sciences that is resulting in fast-paced advances in our understanding of health and disease. Second is the informatics revolution that is more germane to the discussion of this meeting. There are two characteristics of the informatics revolution that make it so compelling and revolutionary. One is the generation and dissemination of significant amounts of health and scientific information that finds its way into the public arena. Second is the proliferation of platforms and devices through which this information is accessed and used by consumer audiences. While these advances in science and informatics are far-reaching and exciting, there are several challenges that deter effective communication of these developments to the public/s including communication inequalities. This paper will highlight some major issues and challenges in communication of science with a particular focus on health and inequalities illustrating our arguments from our more than a decade-long program of research.

Production of Science and Health Information

The production of health information for the public stems from, arguably, three broad sources: mass media channels such as news and entertainment media, private sector communications, and activist groups. Primary exposure from media is supplemented, complemented, and filtered through health systems, specifically health care providers, social networks, and other interpersonal channels. Yet, most exposure occurs at a scale that occurs through the mass media.

The role of journalist’s remains critical even while the role of other channels such as doctors or social media continue. News media continue to frame the issues on health for the Americans
setting the parameters for debate and influencing beliefs and norms, and even behaviors. This is particularly the case in influencing perceptions (e.g. risk) on issues (e.g. Ebola or Zika) on which they have less personal experience.

The quality of reporting on health, however, has been uneven and the consequences have not been trivial. The uneven reportage is mostly because of limitations of journalism rather than any conspiracy or intentions. Partly, these limitations have to do with both their training and reporting practices. Two points illustrate this argument: educational background of journalists who report on health and the origin of ideas for their stories. There are not many data that track health journalists but there is one major study conducted by the National Cancer Institute that offers some interesting insights (Viswanath et al., 2008).

While most of the health journalists have college education and even graduate degrees, only 8% majored in “life sciences” in college. While this by itself is not a weakness, a lack of appreciation for evolutionary and incremental approach to scientific knowledge production leads to reporting that focuses on episodes or major developments rather than science as a process.

Another datum is also instructive. The major sources of ideas and development of stories on health do not necessarily stem from reporters’ initiatives as much as from institutional sources such as press releases, press conferences and wire services. What this clearly demonstrates is the “power” of institutional sources in setting the agenda and framing the health science issues for the publics. It suggests how institutional imperatives of those who have the ability to influence journalistic priorities also have the power to influence public agenda on health and science.
Popular culture too plays a critical role in influencing perceptions of risk and health. It has been well-documented, for example, that children’s exposure to smoking incidents in movies causally leads to experimentation with smoking among those exposed (NCI, 2008).

While most of the attention to production of information on science, especially in health, has focused on the usual suspects such as journalism, private sector has an outsized role in influencing perceptions of risk, promotion of social norms and risk behaviors. It has been well established, for example, that the tobacco industry has for decades tried to influence reporting on health, publicly casting doubts on connection between tobacco use and health and is still successful in preventing policies that promote tobacco control. This is done through both strategic communications (NCI, 2008) and through marketing communications with an annual expenditure of over $9.6 billion in 2014.

Similarly, it has been shown that consumption of sugar-sweetened beverages (SSBs) is a significant contributor to the obesity problem in the United States (Gortmaker et al., 2015). Despite growing evidence on the role of SSBs in obesity, the beverage industry remains successful in marketing its products and successfully repelling any marketing restrictions. For example, in 2014, Coca Cola is estimated to have spent $3.49 billion on advertising. Fast food industry is not too far behind. McDonald’s advertising budget, it was reported, to have been around a billion dollars in 2013. Moreover, the industry has been effective in advocating and lobbying against any restrictions on marketing.
The point is that the role of private sector in the (mis)interpretation of science, in drowning out accurate scientific information and changing or reinforcing unhealthy behaviors has not been sufficiently appreciated.

Last, the role of interest groups, particularly those advocating positions counter to evidence in science cannot under-estimated. One illustration is the persistent and dominant share of voice that anti-vaccine groups continue to receive despite the overwhelming evidence on the safety AND efficacy of vaccines (DHHS, 2015). And, again, the consequences are not trivial.

The Consumption of Health Information

More information on health in the public arena does not mean more communication. There is undoubtedly greater demand for health communication on the part of the public. In fact, Pew Research Centers report that 80% of those who go online look for health information. Yet the very forces that made possible the generation and dissemination of health information through information and communication technologies (ICTs), have also overwhelmed the public ability to cope with the flood of information. Moreover, the nature of scientific practice – slow, cumulative accumulation of knowledge with inbuilt mechanisms of conflict and contradictions, communicate a sense of confusion and contradiction and perceptions that scientists “can’t make up their mind.”

For example, note the following findings from the Health Information National Trends Survey (HINTS) by the National Cancer Institute:

- More than half of the sample agreed that “everything causes cancer”
- About 15% of the respondents said that nothing could reduce a person’s risk of getting cancer.
• Close to 27% of the American public surveyed agreed that there’s not much people can do to lower their chances of getting cancer.

Similarly, causal attributions to diseases and disparities are flawed. There is a robust literature that such social determinants as class, race and place play an outsized role in health and health disparities. Yet, when asked people continue to rank lifestyle as a major contributor to unequal outcomes in health (Nagler, 2016).

Two other factors compound the problem: Innumeracy and a lack of research literacy (Nagler, 2010). Data from HINTS (2007) show that about 38% of the US adults find medical statistics hard to understand, a skill necessary to understand and use science.

Inequalities

Unequal Health

It is now widely accepted that health, just as wealth, is unequally divided with factors such as class, race/ethnicity and place serving as major drivers of these inequalities. With some exceptions, in general, those from higher socioeconomic position, whites and residents living in wealthy neighborhoods enjoy better health and suffer from lower disease burden.

For example, the burden of cancer is distributed unequally across population sub-groups. African-American men and women have higher overall cancer mortality rates than whites. Similarly, Hispanic women are generally diagnosed with later-stage cancer and have poorer survival rates compared to non-Hispanic white women. Furthermore, individuals from lower SEP have higher rates of cancer mortality and lower survival rates compared to their higher SEP counterparts. Cancer risk factors are often more prevalent among those from low SEP groups compared to others suggesting that lifestyle habits and their corresponding cancer
risks may be highly dependent on social and structural contexts. For example, stressors related to poverty and race/ethnicity, such as discrimination or living in unsafe housing, may contribute to higher smoking rates, and therefore to lung cancer disparities, among these groups. Those who have lower income and education and live in inner city environments are less likely to have access to fresh and healthy food options, and issues of affordability and access to healthy foods contribute to poor diets among lower income populations. Place also matters in that some neighborhoods may have less access to services particularly in areas that are more racially segregated. Poverty has a particularly pernicious effect on one’s wellbeing resulting in a vicious circle of isolation, disconnectedness, lack of access to health and telecommunication services, and unhealthy behaviors (Edin, 2015; Viswanath, 2013).

Communication inequalities

In parallel with inequalities in health are communication inequalities between different socioeconomic, racial and ethnic, and geographic groups. To be bluntly put, the benefits from the information revolution have so far accrued unequally across different social groups leading to serious inequalities in the information age.

Communication inequalities may manifest at both macro as well as individual levels. At the macro level, differences in generation, processing and distribution of health information between different groups and institutions have been widely documented. For example, as mentioned earlier, the marketing communications budget of the tobacco industry in 2014 was close to $10 billion, a figure that is many times more than tobacco control budgets of states and federal agencies. This observation did not go unnoticed by the Federal Judge who authored the decision against tobacco a decade ago (NCI, 2008). Examples such as this abound and the
implications are clear. There are clear challenges in communicating science accurately when established and commercial interests are threatened.

At the individual level, communication inequalities are defined as differences in accessing, processing and using health information, thus precluding certain groups from taking advantage of the information revolution. Some key observations based on empirical data illustrate this argument.

There is differential access to and use of new information and communication technologies among different social groups. For example, those who are minorities and from lower socioeconomic status, in general, are less likely to go online, a phenomenon often characterized as the “digital divide.” This divide persists despite the often-celebratory media coverage about how Internet is changing the way we work, live and play. Cell phone use and penetration have, on other hand, increased. Yet, in both cases, we have documented that those who are poor and from rural areas do not enjoy consistent and continuous connection to telecommunication services.

Access alone is not sufficient. A greater proportion of those from lower SEP and racial and ethnic groups do not have the capability to process complex information, because of numeracy and literacy issues. For example, the experience of poverty has a vicious impact on people. The constant struggle to juggle resources creates a mindset of scarcity potentially leading to cognitive overload and differential attentional allocations making it even more difficult to think about health while juggling with other pressing issues (Shah et al., 2012; Viswanath, 2006).

Similarly, in the 2007 HINTS, almost half of those with a household income of less than $20,000 and six of out of 10 adults without a high school diploma reported that they find
medical statistics difficult to understand (Kontos & Viswanath, 2011).

Last, few have the wherewithal to take advantage of the health information to change their lifestyle for better health either because of lack of resources, living in poor neighborhoods characterized by poorer access to services and poor air and unsafe living conditions.

Conclusions

The foregoing review leaves some larger questions for research, and in turn, for practice and policy:

- What are the more effective and models of knowledge translation to influence people and institutions?
- What are the capabilities that are needed to effectively communicate science to the public?
- What models exist that ensures that knowledge translation is not only effective but its impact, equitable?

It is not that there are no openings or models. Participatory approaches to knowledge translation appear to be more helpful in helping communities successfully adapt evidence-based interventions to promote health (Easterly, 2006; Ramanadhan et al., Under Review). Our Randomized controlled Trial to bridge digital divide, Click to Conncct, clearly showed that use of the Internet for health is closely related to use of Internet for other “capital enhancing” information (McLoud et al., In 2016). These data suggest that bridging gaps is possible if we take into account the social context of daily lives of those who are typically underserved.

There is no question that the informatics and biomedical revolutions have opened incredible possibilities in using science to expand knowledge and use that knowledge for
betterment of the human conditions. Yet, the divides that characterized the 20th century – race, class, and place – appear to persist into the 21st century threatening the promise that science is supposed to finally fulfill. Communication of science, then, is not just about accuracy or fidelity, as much as it is about a moral obligation to serve those who are not in a position to take advantage of its advances.
Selected References


Table 1. Story Identification and Development by Geographic Scope and Type of Medium*

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Key: *p<.05 National versus Local; #p<.05 Print versus Broadcast

Table 2. Reliance on Different Sources by Geographic Scope and Medium*

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