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Using Text Messages to Improve Patient-Doctor Communication among Racial and Ethnic Minority Adults: An Innovative Solution to Increase Influenza Vaccinations

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Introduction

Every year, anywhere from 5–20% of the U.S. population contracts influenza (Centers for Disease Control and Prevention, 2013c). Although the effects of the disease are usually mild, influenza can cause severe illness, and even death (Fiore et al., 2010). In addition to its direct symptoms, influenza is responsible for many secondary circulatory and respiratory complications (Fiore et al., 2010). An influenza pandemic and its consequences could be avoided if individuals receive influenza vaccinations; with large-scale immunization, up to \$166.5 billion (Meltzer et al., 1999) and over 600,000 years of life (Molinari et al., 2007) would be saved. In 2010, the CDC issued such a recommendation, advising that everyone aged six months and older be vaccinated for influenza (Fiore et al., 2010). Using data from the 2006–2011 influenza seasons, the CDC published a model describing the positive impact of its recommendation for near-universal influenza vaccination (Kostova et al., 2013). After applying this model to the 2012–2013 influenza season, the CDC found that the updated recommendation mitigated the contraction and medical consequences of influenza during

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2012–2013, which saw 17% fewer hospitalizations and the prevention of about 6.6 million influenza illnesses that would have otherwise occurred (Centers for Disease Control and Prevention, 2013a).

Racial and Ethnic Disparities in Influenza Vaccination

Influenza vaccination rates among U.S. adults are still startlingly low; even after 2010, when the CDC increased the recommended number of individuals who should be vaccinated, only 42% of adults received vaccine during the 2012–2013 influenza season (Centers for Disease Control and Prevention, 2013b). This is still far from the 80% minimum target influenza vaccination rate set by the *Healthy People 2020* goals (U.S. Department of Health and Human Services, 2013b). Additionally, a recent study found that racial and ethnic minorities—traditionally underserved populations in healthcare—have the lowest influenza vaccination rates (McIntyre et al., 2013). Data collected from the National Internet Flu Survey, which surveyed adults 18 years and older during November 2013, indicated that only 34.6% of Blacks and 37.3% of Hispanics were vaccinated for influenza, as compared to 39.8% of Whites (Centers for Disease Control and Prevention, 2013b). While influenza vaccination rates are low across all populations, they are lowest among racial and ethnic minorities. This has resulted in the over-representation of racial and ethnic minorities in influenza-related hospitalizations, which were nearly twice as high as the rate for White patients in 2009–2010 (Dee et al., 2011). Specifically, Blacks appear to face the largest disparity—while Hispanics saw an increase in influenza vaccination from 2012–2013, Black influenza vaccination rates have been consistently low (Centers for Disease Control and Prevention, 2013b).

Barriers to Influenza Vaccination

In 2010, after the CDC's updated influenza recommendations were released, only 37.8% of Blacks and 33.8% of Hispanics knew they should be vaccinated against influenza, as compared to 49.1% of Whites (Maurer et al., 2012). In addition to not knowing whether or not they should seek influenza vaccinations, some patients, regardless of race, do not know when to be vaccinated, assume healthy people do not need to be vaccinated, are concerned about potential side-effects of the vaccination, or experience other barriers to vaccination (Johnson et al., 2008). Multiple studies have found that Hispanic patients perceive access and cost as barriers to influenza vaccination (Chen et al., 2007; Cohen et al., 2012). Other studies have found that Black and Hispanic patients are more likely than White patients to perceive the influenza vaccination as being ineffective (Wooten et al., 2012) and to think they can get influenza from receiving the vaccine (Chen et al., 2007; Wooten et al., 2012). A study of Hispanic participants revealed that physicians not mentioning the influenza vaccination was among the top ten reasons for not getting vaccinated (Cohen et al., 2012). Myths and concerns about the influenza vaccination, as well as ineffective patient-doctor communication about the subject, could be resolved, in part, by improving patient communication with their doctors about influenza.

The Influence of Poor Patient-Doctor Communication on Influenza Vaccinations

In a recent study, over 75% of patients responded that they would be more likely to get an influenza vaccination if their healthcare provider recommended it (Johnson et al., 2008). Moreover, 38% reported that they were not vaccinated for influenza because their doctor never told them they needed to be vaccinated (Johnson et al., 2008). This highlights the influence of patient-doctor communication on influenza vaccination, among other previously mentioned barriers. Problems of poor communication are exacerbated among racial and ethnic minorities, who often experience the least effective patient-doctor communication (Ashton et al., 2003) and are generally less satisfied with the communication they have with their doctors (Doescher et al., 2000). This may be due, in part, to doctors' preconceptions about minority patients. Research has found that doctors communicate better with patients who present themselves as effective communicators—those who ask questions and express an interest in their health (Street et al., 2007). Unfortunately, some doctors perceive their Black patients as poor communicators (Street et al., 2007) and tend to give them less health information (Gordon et al., 2006). These behaviors may be playing a role in poor influenza vaccination rates among minority patients, especially Black patients. It is possible that improved patient-doctor communication could reduce the gap between patients who would like to be vaccinated and those who are actually offered the vaccination by making it a more urgent topic of discussion. In turn, increased discussion could allow physicians to dispel certain myths and patient misconceptions about the vaccination that may prevent some patients from getting vaccinated.

The Promise of an Influenza Vaccination mHealth Campaign

mHealth refers to the use of mobile technology to improve health outcomes and healthcare services at a low cost (Martin, 2012). An mHealth campaign using text messages may be especially effective at reaching racial and ethnic minorities, as 85% of Blacks and 87% of Hispanics send and receive text messages (Duggan, 2013). Additionally, Black patients are reportedly the most receptive group to receiving health information via text (Fox and Duggan, 2012). Text messages are advantageous because they are read frequently and are checked many times throughout the day (Gibbs, 2012). Therefore, the time at which a text message is sent can be optimized for maximum effectiveness. For example, messages can be sent at strategic times, such as at the beginning of influenza season, or even just before an individual's doctor's appointment. A study published in 2010 confirmed the benefits of text message campaigns, concluding that text messaging is a promising tool for improving health because of its availability, relatively low cost, widespread use, technological ease, and applicability to many health conditions (Cole-Lewis et al., 2010). A text message campaign that sends messages to racial and ethnic minority adults prompting them to talk to their doctors about influenza vaccinations could be an effective way to address this current health disparity.

A vaccine-related campaign is both feasible and has shown potential among racial and ethnic minorities. A study conducted in 2011 assessed Latino preferences for a text message reminder for early childhood vaccinations and found that 88% would feel somewhat or very

comfortable receiving text messages about health-related issues (Hofstetter et al., 2013). Respondents were also receptive to receiving vaccine text messages at nearly any time of day (Hofstetter et al., 2013). Cost was a minimal issue—fewer than 30% of respondents perceived cost as a barrier and 85% had unlimited text messaging plans (Hofstetter et al., 2013). With the availability of free and open source text messaging platforms, such as Frontline (FrontlineSMS), Data Dyne (Data Dyne), and SMSMarketing360 (SMSMarketing360), a text message campaign for influenza vaccinations is quite feasible. Vaccination reminders also could be integrated with electronic health records to send messages to patients as their next appointment approaches (Stockwell et al., 2013).

Text message mHealth campaigns for influenza vaccination have already proven successful among certain targeted populations. A pediatric and adolescent study that sent participants educational text messages about influenza vaccinations and where to get them, observed an increase in influenza vaccination rates among those who received the messages (Stockwell et al., 2012). A similar study among predominantly racial and ethnic minority pregnant women found that those who received text messages were 30% more likely to be vaccinated for influenza than those who did not receive text messages (Stockwell et al., 2014). Such strategies can be expanded to reach a wider population of racial and ethnic minority adults, regardless of gender or pregnancy status. This would allow those who are the least vaccinated to receive strategic intervention efforts that can help equalize the racial and ethnic disparity in influenza vaccination rates.

mHealth campaigns can send health prompts encouraging patients to talk to their doctors about influenza vaccinations, and can also be effectively utilized for educational purposes (Stockwell et al., 2012; Stockwell et al., 2014). A campaign could send patients text messages about disease risk and vaccine recommendations, effectiveness, safety, and accessibility. Such a campaign could ultimately function as a “cue to action,” priming patients to talk to their doctors about the messages' educational content and take charge of their health. This could be an effective way to educate patients and improve the patient-doctor relationship, as studies have shown that patients are receptive to strategies that highlight the importance of engagement (Deen et al., 2012) and doctors are more receptive to engaged patients (Street et al., 2007). An mHealth influenza vaccination campaign could simultaneously improve patient-doctor communication, improve patient engagement, increase knowledge about influenza vaccination, and ultimately increase influenza vaccination rates.

Conclusion

Racial and ethnic minorities carry the largest influenza disease burden, yet are still the least vaccinated populations. Unfortunately, these adults face many barriers to influenza vaccination, calling for a multi-faceted approach to increase influenza vaccination rates. This could involve system-based interventions as well as patient-focused interventions. System interventions could include reminders to providers, using health information technology to provide standing orders, and dedicated vaccination clinics (Zimmerman et al., 2003). Patient-focused interventions could include text messages with educational information to resolve misconceptions, patient reminders, or prompts encouraging patients

to talk to their doctors about influenza vaccinations. The implementation of a targeted mHealth text message campaign that encourages minority patients to initiate conversations with their doctors about influenza vaccinations would address knowledge gaps, dispel misconceptions, and potentially provide a crucial push to get vaccinated.

In her 2011 mHealth Summit keynote address, former U.S. Secretary of Health and Human Services, Kathleen Sebelius, emphasized the potential of mobile technology to open up lines of patient-doctor communication and engage patients in their health care, especially among hard to reach populations, such as racial and ethnic minorities (Sebelius, 2011). An innovative text message mHealth campaign would effectively address some of the primary barriers racial and ethnic minority patients face in receiving influenza vaccinations and could open the door to increased utilization of text message interventions for an increasingly mobile demographic. Further research is needed to determine the effectiveness of an influenza vaccination text message campaign in reducing racial and ethnic health disparities; however, such a campaign has the potential to accomplish *Healthy People 2020* goals: increasing influenza vaccination rates, increasing satisfactory patientdoctor communication, increasing the use of new technology for healthcare management, and reducing health disparities (U.S. Department of Health and Human Services, 2013a).

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References

- Ashton CM, Haidet P, Paterniti DA, et al. Racial and ethnic disparities in the use of health services: bias, preferences, or poor communication? *J of Gen Intern Med*. 2003; 18(2):146–152. [PubMed: 12542590]
- Centers for Disease Control and Prevention. Estimated influenza illnesses and hospitalizations averted by influenza vaccination - United States: 2012-13 influenza season. *Morbidity and Mortality Weekly Report (MMWR)*. 2013a; 62(49):997–1000.
- Centers for Disease Control and Prevention. National Early Season Flu Vaccination Coverage, United States, November 2013. Atlanta, GA: Centers for Disease Control and Prevention, 2013; 2013b. Available at: <http://www.cdc.gov/flu/fluview/nifs-estimates-nov2013.htm> [Accessed on 12 July, 2014]
- Centers for Disease Control and Prevention. [Accessed on 12 July, 2014] Seasonal Influenza Q&A. 2013c. Available at: <http://www.cdc.gov/flu/about/qa/disease.htm?>
- Chen JY, Fox SA, et al. Health disparities and prevention: racial/ethnic barriers to flu vaccinations. *J Community Health*. 2007; 32(1):5–20. [PubMed: 17269310]
- Cohen B, Ferng YH, et al. Predictors of flu vaccination among urban Hispanic children and adults. *J of Epidemiol and Community Health*. 2012; 66(3):204–209. [PubMed: 20881023]
- Cole-Lewis H, Kershaw T, et al. Text messaging as a tool for behavior change in disease prevention and management. *Epidemiol Rev*. 2010; 32(1):56–69. [PubMed: 20354039]
- Data Dyne. [Accessed on 12 July, 2014] Magpi: Fast, Easy Mobile Data for Health, Agriculture, Education, Conservation, Commerce and More!. Available at: <http://www.datadyne.org/magpi-mobile/>

- Dee DL, Bensyl DM, Gindler J, et al. Racial and ethnic disparities in hospitalizations and deaths associated with 2009 pandemic Influenza A (H1N1) virus infections in the United States. *Ann of Epidemiol.* 2011; 21(8):623–630. [PubMed: 21737049]
- Deen D, Lu WH, et al. The impact of different modalities for activating patients in a community health center setting. *Patient Educ Couns.* 2012; 89(1):178–183. [PubMed: 22683294]
- Doescher MP, Saver BG, Franks P, et al. Racial and ethnic disparities in perceptions of physician style and trust. *Arch of Fam Med.* 2000; 9(10):1156–1163. [PubMed: 11115223]
- Duggan, M. [Accessed on 12 July, 2014] Cell Phone Activities 2013. Pew Research Internet Project. 2013. Available at: http://www.pewinternet.org/files/old-media/Files/Reports/2013/PIP_Cell%20Phone%20Activities%20May%202013.pdf
- Fiore AE, Uyeki TM, Broder KI, et al. Prevention and control of influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2010. *Morbidity & Mortality Weekly Report Recommendations & Reports.* 2010; 59(RR 8):1–62. [PubMed: 20689501]
- Fox, S.; Duggan, M. [Accessed on 12 July, 2014] Mobile Health 2012. Pew Research Internet Project. 2012. Available at: http://www.pewinternet.org/files/oldmedia/Files/Reports/2012/PIP_MobileHealth2012_FINAL.pdf
- FrontlineSMS. [Accessed on 12 July, 2014] Connect your world. Available at: <http://www.frontlinesms.com>
- Gibbs, N. Your Life is Fully Mobile. New York, NY: Time; 2012. Available at: <http://techland.time.com/2012/08/16/your-life-is-fully-mobile/> [Accessed on 12 July, 2014]
- Gordon HS, Street RL Jr, et al. Racial differences in doctors' information-giving and patients' participation. *Cancer.* 2006; 107(6):1313–1320. [PubMed: 16909424]
- Hofstetter AM, Vargas CY, et al. Parental and provider preferences and concerns regarding text message reminder/recall for early childhood vaccinations. *Prev Med.* 2013; 57(2):75–80. [PubMed: 23624252]
- Johnson DR, Nichol KL, Lipczynski K, et al. Barriers to adult immunization. *Am J of Med.* 2008; 121(7 Suppl 2):S28–S35. [PubMed: 18589065]
- Kostova D, Reed C, et al. Influenza Illness and Hospitalizations Averted by Influenza Vaccination in the United States: 2005–2011. *PLoS One.* 2013; 8(6):e66312. [PubMed: 23840439]
- Martin T. Assessing mHealth: opportunities and barriers to patient engagement. *J of Health Care for the Poor & Underserved.* 2012; 23(3):935–941.
- Maurer J, Harris KM, Parker AM, et al. Who knew? Awareness of being recommended for influenza vaccination among U.S. adults. *Influ & Other Respir Viruses.* 2012; 6(4):284–290.
- McIntyre AF, Gonzalez-Feliciano AG, Bryan LN, et al. Seasonal Influenza Vaccination Coverage—United States: 2009–10 and 2010–11. *Morbidity and Mortality Weekly Report (MMWR).* 2013; 62(3):65–68. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/su6203a11_e.s_cid=su6203a11_e.
- Meltzer MI, Cox NJ, Fukuda K, et al. The economic impact of pandemic influenza in the United States: priorities for intervention. *Emerg Infect Dis.* 1999; 5(5):659–671. [PubMed: 10511522]
- Molinari NA, Ortega-Sanchez IR, Messonnier ML, et al. The annual impact of seasonal influenza in the US: measuring disease burden and costs. *Vaccine.* 2007; 25(27):5086–5096. [PubMed: 17544181]
- Sebelius, K. 2011 mHealth Summit, Washington, DC, Dec 5–7, 2011. Vol. 8. Bethesda, MD: National Cancer Institute; 2011 Dec 13. mHealth Summit Keynote Address. Available at: <http://www.cancer.gov/ncicancerbulletin/121311/page4> [Accessed on 12 July, 2014]
- SMSMarketing360. [Accessed on 12 July, 2014] Text Message Marketing Platform That Drives Results. Available at: <http://www.smsmarketing360.com>
- Stockwell MS, Fiks AG. Utilizing health information technology to improve vaccine communication and coverage. *Hum Vaccin Immunother.* 2013; 9(8):1802–1811. [PubMed: 23807361]
- Stockwell MS, Kharbanda EO, et al. Effect of a text messaging intervention on influenza vaccination in an urban, low-income pediatric and adolescent population: a randomized controlled trial. *J of Am Med Assoc.* 2012; 307(16):1702–1708.

- Stockwell MS, Westhoff C, et al. Influenza vaccine text message reminders for urban, low-income pregnant women: a randomized controlled trial. *Am J of Public Health*. 2014; 104(1):2014.
- Street RL Jr, Gordon H, Haidet P. Physicians' communication and perceptions of patients: Is it how they look, how they talk, or is it just the doctor? *Soc Sci & Med*. 2007; 65(3):596–598.
- U.S. Department of Health and Human Services. [Accessed on 12 July, 2014] Healthy People 2020. 2020 Topics & Objectives. 2013a. Available at: <http://www.healthypeople.gov/2020/topicsobjectives2020/default.aspx>
- U.S. Department of Health and Human Services. [Accessed on 12 July, 2014] Healthy People 2020. Immunization and Infectious Diseases. 2013b. Available at: <http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=23>
- Wooten KG, Wortley PM, et al. Perceptions matter: beliefs about influenza vaccine and vaccination behavior among elderly white, black and Hispanic Americans. *Vaccine*. 2012; 30(48):6927–6934. [PubMed: 22939908]
- Zimmerman RK, Nowalk MP, Raymund M, et al. Tailored interventions to increase influenza vaccination in neighborhood health centers serving the disadvantaged. *Am J Public Health*. 2003; 93:1699–1705. [PubMed: 14534225]

Highlights

- Racial and ethnic minority adults have low influenza vaccination rates
- Poor patient-doctor communication is one of many barriers to influenza vaccination
- A text message mHealth campaign can improve influenza vaccination rates
- Messages can provide vaccine education and prompt patients to talk to their doctors
- Addresses *Healthy People* goals: increase flu vaccination, reduce health disparities