

Best Practices: A Network of the Mandatory Influenza Vaccination Among Healthcare Workers

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Purpose

Describe how social network analysis can be used to recruit influential allies from within healthcare workers' (HCWs) networks to spread mandatory vaccination information among HCWs and identify individuals who will need direct follow-up.

Background

This best practice project addressed the use of social network practice and examined how it can be applied to improve the influenza vaccination rate of HCWs in a healthcare system. Annual influenza vaccination rates among HCWs have been historically low. Studies have shown that the most effective way to increase the vaccination rate among HCWs is to implement mandatory vaccination campaigns.

Vaccination

Annual influenza vaccinations among HCWs have historically fallen short of the 90% goal set by Healthy People 2020.¹ The typical vaccination rate among HCWs is between 40-50% with voluntary programs and reach as high as 60% with use of incentive based programs. Only the addition of a mandatory vaccination policy has enabled vaccination levels above 90%.¹ Mandatory vaccinations do raise an ethical dilemma. Is there a right to infringe on one's autonomy by requiring a vaccination? Five justificatory conditions help determine if promoting public health warrants overriding autonomy which include: effectiveness, proportionality, necessity, least infringement, and public justification. Using these justifications and the underlying belief in healthcare of "do no harm" present a compelling argument for mandatory influenza vaccinations among HCWs.

Complexity

Research involving complexity can be used to solve communication problems with the mandatory vaccination of HCWs. The behavior of a complex system is nonlinear, changeable, sensitive to small changes and is fundamentally unpredictable over time. Complexity science has shown that it is often better to try multiple approaches and let direction arise by gradually shifting time, resources and attention towards things that seem to be working best. The study of complexity can advise public health officials to use nonlinear models, accept unpredictability and respond flexibly to emerging patterns.²

Social Network Analysis and Theory

Social network analysis is key in understanding a network and how information spreads through it. Social network analysis has shown that people do not interact randomly: HCWs in a hospital environment interact with some people more than others. The application of using social networks on real world situations allows us to see problems and possibilities in a new way.³ Social network analysis provides the ability to observe ties to nodes within the network. It allows for an understanding of how information will flow through the network as well as which node will pass information to other nodes. A questionnaire is used to gather information about the network. That information is then placed in a table which in turn is imputed into software such as NodeXL or UCInet which are later visualized in a sociogram as in Figure 1.

NodeXL Sociogram of Simulation from Fictional Data

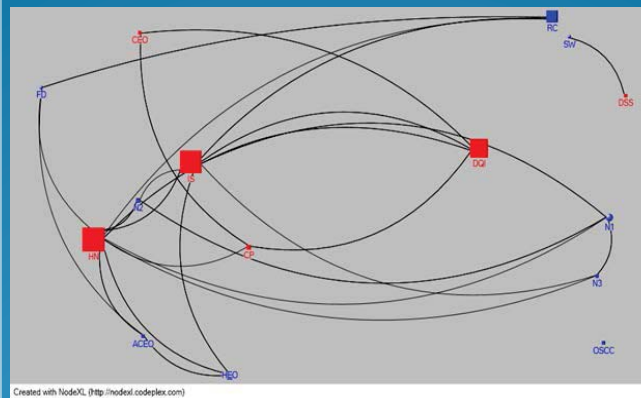


Figure 1. The color red represents management level HCWs and the color blue represents hourly paid HCWs. Squares represent being vaccinated and circles represent not being vaccinated.

As shown in Figure 1,

1. Nodes HN, IS, and DQI will be key players in distributing information due to their high betweenness centrality (accumulation of ties to other nodes).
2. Node OSCC is an outlier and does not have a connection to any other node in the network.

Best Practice

- Mandatory influenza vaccination programs for HCWs reach the highest rates of vaccination.¹
- Educational programs should accompany all mandatory vaccination programs:
 - Benefits to patients and employees
 - Information about the virus
 - Information on vaccine itself
 - Present information in multiple forms
- Social network analysis should be utilized to determine the best way to distribute information to hospital staff.
- Structural implications for Mandatory Vaccination Policy:
 - Multiple modes of communication could be used from e-mail, to interoffice mail or phone calls to ensure that the outlying nodes receive the information they need.
 - Providing follow up with the outlier can also ensure that the node has the chance to voice concerns and raise questions about the information being shared.
 - If an employee is not vaccinated, find out if there is a structural pattern.
 - Leverage the nodes with the highest betweenness centrality but learn what information they are spreading.
 - Do not rely on published organizational charts as the important informal networks usually differ.

Recommendations

Mandatory influenza vaccination programs will provide the highest rate of vaccination among HCWs. It is important that education materials be presented to the hospital staff to help them understand the need for the campaign. Social network analysis can be used to help determine the best way to distribute this information by pinpointing influential allies within departments and staff that might be outside of the information flow. These outliers need extra follow-up to ensure their understanding of the campaign.

References

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