How Social Networks Can Affect Infectious Disease Control: An Experience From Northwest Iran

To the Editor—Social networks are a recent phenomenon of technology that affects all aspects of life, including infectious disease, and it has become increasingly important to understand their features and limitations.[1] Also, information, trends, behaviors and even health states may spread between contacts in a social network, similar to disease transmission. However, information that propagates through social networks can carry a lot of false claims. For example, rumors on certain topics can propagate rapidly, leading to a large number of nodes reporting the same (incorrect) observations.[2]

In February 2015, a 35-year-old fruit seller with acute respiratory infection was hospitalized with some sign of hemoptysis in a Tabriz health center in northwest Iran. Because of suspected contact with the Hajj [pilgrimage] makers who returned to Iran, specific measures were taken to deal with Ebola. In this period, an image of the patient and hospital staff wearing special clothing to protect against Ebola was released on social networks and spread quickly. In addition, the event occurred during an influenza pandemic, which caused spreading fear and horror of an Ebola epidemic among the public of the city or even the country. The public fear was reduced with repeated interviews, mobilizing of hospital staffs to accept suspected patients, and provision of a rapid test for the detection of influenza, actions that were appropriate in control of the disease. Thus consideration of social transmission and network effects is an important issue for health and policy professionals. Also, it is of great importance to educate employees about putting information and images of patients on social networks with respect to propagation velocity.

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National Survey of Infectious Diseases Physicians on Prevention Practices for Multidrug-Resistant *Acinetobacter baumannii* in Thailand

To the Editor—Multidrug-resistant *Acinetobacter baumannii* (MDRAB) has emerged as a major cause of healthcare-associated infection and has become an infection prevention and control (IPC) challenge.[1–3] The results of a prior Thai national survey indicated that a physician leader in infection control and participation in a collaborative effort to prevent MDR organisms were associated with a reduction in drug-resistant A. *baumannii* infections.[3] A paucity of data regarding effective infection prevention of MDRAB prompted a 2014–2015 national survey to evaluate practices aimed at minimizing endemicity and reducing the spread of MDRAB.

Between June 1, 2014, and March 1, 2015, board-certified infectious diseases physicians (IDPs) in Thailand were interviewed using a standardized questionnaire. Survey items included IPC hospital activities, policies, and outcomes associated with MDRAB control. All IDPs were invited to participate in this study, and 1 IDP per hospital with responsibility for MDRAB control was interviewed if consent was obtained. The study exclusion criterion was decline for interview. Data variables included hospital characteristics, IPC practices and MDRAB policies, and estimated rates of MDRAB infection. Hospital characteristics included type and level of hospital, medical school affiliation, and participation in a collaborative network to reduce multidrug-resistant organisms (MDROs), safety score, leadership support, and prevalence of MDROs. The rates of MDRAB before and after implementation of IPC policies were acquired from IPC databases, and implementation of IPC was defined as implementation of standard versus intensified IPC interventions to control MDRAB based on the recommendations of the Healthcare Infection Control Practices Advisory Committee.[4] All data pertaining to IPC and compliance with each recommended measure were abstracted from each hospital's infection control (IC) database.

TABLE 1. Characteristics of 43 Hospitals with Infectious Diseases (ID) Physicians who Reported Multidrug-Resistant *Acinetobacter baumannii* (MDRAB) Infection Prevention and Control Strategies

	Reported Success, No. (%)		
Variable	Success (N = 22)	Non-Success (N = 21)	*P* Value
Sex, male	11 (50)	11 (49)	.82
Age, median y (range)	35 (26–52)	37 (28–61)	.19
ID practice duration, median y (range)	9 (1–22)	6 (1–18)	.09
Hospital type			.04
Government	9 (41)	7 (33)	
University	4 (18)	5 (24)	
Military	2 (9)	1 (5)	
Private	14 (64)	1 (5)	
Medical school affiliation	18 (82)	18 (86)	.87
Safety score, No. (range)	9 (7–10)	6 (4–8)	.04
Participating in collaborative network	19 (90.4)	7 (33)	<.001
Good to excellent leadership support	22 (100)	15 (71)	<.001
Involvement in Infection Control (IC) team			.96
Head of IC team	20 (90.9)	19 (90.4)	
Member of IC team	2 (9.1)	2 (9.6)	
Prevention and control of MDRAB in hospital			<.001
Standard and intensified IC implementation	21 (95.4)	7 (33.3)	
Standard IC implementation	1 (4.5)	14 (66.7)	

NOTE. Unless indicated otherwise, analyses were performed using SPSS, Statistics version (IBM, Armonk, NY). Fisher's exact or χ^2 test was used to compare categorical data, as appropriate. Continuous variables were compared using the Mann-Whitney U Test. All *P* values were 2-tailed; $P<.05$ was considered statistically significant; multivariate analysis was performed to evaluate factors associated with successful implementation of IPC intervention to reduce MDR-*Acinetobacter baumannii*.

Standard IC interventions were defined as existing hospital interventions for hand hygiene, contact isolation, cohort isolation, and environmental cleansing. Intensified IC intervention were defined as existing hospital interventions for active surveillance cultures, intensified environmental cleansing (eg, use of hydrogen peroxide vaporization), and source control strategies (eg, chlorhexidine bath).[4] Hospital compliance with IC interventions was categorized as low (<40%), moderate (40%–75%), or high (>75%).[5] Successful MDRAB reduction was defined as >25% reduction in the hospital's MDRAB infection rate 12 months after the implementation of an IC protocol to control MDRAB. Each institution's safety culture was assessed using a validated safety score metric, calculated as the mean of responses in agreement with 2 standard statements about safety.[6] Before calculating the survey scores, relevant responses were reverse coded; a higher score indicated greater emphasis on patient safety.[5] Infection control support was defined, as previously described, by a composite response to staffing, financial, and political aspects by hospital administration, which were categorized by the lead IDP as poor, fair, good, very good, or excellent.[6] Good and excellent support were combined as a single response in the multivariate analysis.

Among 183 board-certified IDPs across 43 hospitals in Thailand, 43 IDPs were involved in IPC activities and met study inclusion criteria. Of these 43 IDPs, 36 (84%) worked at tertiary care hospitals, and 39 (90%) served as chairs of their respective IC committee. The most commonly reported MDR pathogens were MDRAB (30 of 43 hospitals; 70%) and carbapenem-resistant *A. baumannii* (13 of 43 hospitals; 30%). Standard IC interventions were implemented in 15 hospitals (35%), while intensified IC interventions were implemented in 28 hospitals (65%). Overall, 22 hospitals (54%) reported successful MDRAB reduction (Table 1). Most hospitals reported moderate-to-high compliance with hand hygiene (100%), contact isolation (93%), and environmental cleaning (91%). Intensified interventions were used less often: chlorhexidine bath (27%), hydrogen peroxide vaporizer (17%), and active surveillance (17%). By multivariate analysis, IDPs from hospitals with successful containment reported good-to-excellent leadership support (adjusted odds ratio [aOR], 10.19; 95% confidence interval [CI], 1.24–24.42; $P=.001$), working at a private hospital (aOR, 5.4; 95% CI, 1.5–45.42; $P=.04$), implementation of intensified IPC interventions in addition to standard IC practices (aOR, 9.3; 95% CI, 2.24–36.69; $P=.004$), and involvement in collaborative networks (aOR, 6.4; 95% CI, 2.12–54.45; $P=.02$).

In a previous Thai national survey to evaluate endemic MDRAB risks, a physician-led IC team and participation in a collaborative effort to prevent MDRAB were associated with implementation of MDRAB IPC policies.[3] Notably, no analysis was performed to evaluate the predictors for containment of MDRAB in that study.[3] Likewise, hospitals with good-to-excellent safety culture, administrative support, and participation in a collaborative effort were predictors of policies to reduce healthcare-associated infections in 2 Asia-Pacific countries.[6,7] These are essential prerequisites that hospitals should have in place to achieve successful MDRO IPC. In this study, we confirm that both hospital-level factors (ie, excellent safety culture and leadership support) and individual-level factors (ie, knowledge regarding implementation of intensified IC programs and involvement in collaborative networks) are important predictors for successful containment of MDRAB in hospitals with IDPs in Thailand.

We are aware of several limitations in this study. First, the small sample size limited our capacity to analyze other important factors potentially associated with successful containment of MDROs (eg, predictors for implementation of individual intervention and level of compliance needed to achieve successful containment of each intervention). Second, survey data were subject to recall bias associated with interventions that each IDP implemented. This bias was likely low given that all information was derived from hospital IC databases, including levels of compliance with each IPC intervention. Nonetheless, our study highlights some important modifiable gaps in MDRO containment. Further education regarding implementation of intensified IC interventions, along with sustainable IDP networks, is needed to contain the increase in MDRAB prevalence in this middle-income country.

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Wisdom of Microbial Pathogens: A Novel Approach to Develop Antimicrobials Against Methicillin-Resistant *Staphylococcus aureus*

To the Editor—Staphylococcus aureus is the one of the most commonly isolated human bacterial pathogens causing skin and soft-tissue infections, endovascular infections, osteomyelitis, pneumonia, endocarditis, septic arthritis, and sepsis. Methicillin-resistant *S. aureus* (MRSA) isolates have developed resistance to all available penicillins and other β-lactam antimicrobial drugs.[1] A few drugs, such as vancomycin (glycopeptide), daptomycin (lipopeptide), and linezolid (oxazolidinone), have been approved for the treatment of serious infections caused by MRSA. However, different MRSA strains have already been emerging with resistance to these last-resort antimicrobial drugs.[2–4] These resistance trends for newer drugs emphasize the ongoing need for new and more potent antimicrobial drugs. Successful pathogenic bacteria may have to outcompete other coinfecting bacteria to stay in their eukaryotic host, such as humans. This interplay between pathogenic bacteria may lead to development of new antimicrobials.

In the present study, 39 *Pseudomonas aeruginosa* isolates were screened against MRSA. *P. aeruginosa* were isolated from various patients admitted in different Indian health centers. Four different strains of MRSA were used for susceptibility assays. *S. aureus* ATCC 25923 was used as a control strain.