**Conclusion:** Stable Fe$_3$O$_4$ nanoparticles were successfully synthesized. In vitro assay showed that at the highest dose of iron oxide (6.5pg/mL), the growth of H1N1 virus was inhibited significantly compared with the control samples. Indicates that Iron oxide nanoparticles have potential for use as antiviral activity.

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**Design of a study to examine contact mixing and acute respiratory infection in Ballabgarh, Haryana**

S. Kumar$^{1,∗}$, R. Amarchand$^2$, M. Gosain$^2$, H. Sharma$^3$, F. Dawood$^4$, S. Jain$^5$, K. Lafond$^6$, M.-A. Widdowson$^4$, J. Read$^7$, A. Krishnan$^2$

1 University of Pittsburgh, Pittsburgh, PA, USA  
2 All India Institute of Medical Sciences, New Delhi, India  
3 Delhi University, New Delhi, India  
4 Centers for Disease Control and Prevention, Atlanta, GA, USA  
5 Centers for Disease Control and Prevention, India  
6 Centers for Disease Control and Prevention, Atlanta, USA  
7 University of Lancaster, Lancaster, United Kingdom

**Background:** Data on contact mixing are critical to understanding the spread of epidemics and pandemics that may disproportionately affect developing countries, but few studies have estimated contact mixing in these settings. We describe the design of a planned contact mixing study nested within an ongoing acute respiratory infection (ARI) study in Ballabgarh, Haryana. The contact mixing study aims to 1) describe the social contact patterns of individuals in this rural Indian population, where caste, gender, and age hierarchies are hypothesized to influence interactions, and 2) examine the impact of contact heterogeneities on influenza and general ARI risk after controlling for age.

**Methods & Materials:** Along with weekly household visits to capture ARI and influenza episodes in all residents in a sample of 900 households, we will capture information on social contacts over a sampled day from all individuals in these households. A structured questionnaire of social contacts (conversational within 3 feet or physical) over the past 24 hours will be administered in a face-to-face interview with each respondent. Respondents will report age and sex of contacts, along with the total duration of encounter(s), place of contact (at home, work, school, during transport, or other), and location of the contact of maximum duration (geocoded).

**Results:** In a pilot study conducted in July 2015 that served to establish feasibility, 77 individuals reported 922 contacts during the previous 24 hours. Assortative mixing (mixing with similar people) by age and sex was apparent. Females made fewer contacts than males (one-way ANOVA $F(1, 75) = 4.89; p=0.030$) and had more contacts within the home than outside compared with men ($F(1, 75) = 5.42; p=0.023$). We will present analyses from the planned study, including age contact matrices, and draw preliminary conclusions on mixing in households and other locations in this rural Indian population.

**Conclusion:** One limitation of our study is that the validity of self-reported contacts may vary by age and gender. This novel study in India will, however, lay the foundation to explore social mixing patterns using passive and technological data collection methods, as well as for mathematical and computational explorations of influenza transmission and interventions to reduce disease burden.

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**Social media for infection control and prevention**

V.V. Kumar$^{1,∗}$, P. Thirumalaikolundusubramanain$^2$, A. Uma$^2$, N. Balamurugan$^3$

1 Chennai Medical College Hospital & Research Centre, Trichy, Tamil Nadu, India  
2 Chennai Medical College Hospital & Research Centre, Trichy, India  
3 Sri Gokulam Hospital, Salem, India

**Background:** India is a vast country with diversities and various infectious diseases. Large number of Indians uses social media. 

**Objectives:** To elicit the view of college students on their participation for infection control and prevention.

**Methods & Materials:** A questionnaire survey was circulated among 200 college students to elicit their willingness to learn and support infection control and prevention through Social media. The questionnaire consisted of willingness to learn on disease outbreaks, symptoms, and health care advice; report to authorities and participate in prevention aspects.

Training on selected aspects of infection among all students of higher education was checked through respective web sites.

The data was analysed statistically.

**Results:** Of the 200, 180 were familiar with social media and were willing to participate on all aspects of infection control and prevention. They were also willing to pass on the infection related information to others nearby and far away through social networking and support the governmental programmes for prevention. There were no structured training programmes on selected aspects of infection among all students of higher education.

**Conclusion:** College students are interested in infections and infection control, and in social media. Hence, every student shall be informed and empowered on basics and prevention aspects of infectious diseases through National Social Services, Youth Red cross or other several social service systems prevalent in respective colleges, in an uniform manner and monitored by University Grand Commission (UGC), as infection related aspects do not receive due attention. For effective control and prevention of infection in India, activities and participation of students and colleges on infection control have to be incorporated in the assessment of the college by various Accreditation councils or Assessment systems. Accordingly
Health and Family Welfare Department of India should use Social Media to empower college students, and utilize their services for infection control and community education.

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Institutional Chickenpox Prevention Programme (ICPP) in a tertiary care hospital in Singapore: Lessons from epidemiology and contact tracing

1 National University Hospital, Singapore, Singapore
2 National University Hospital, Singapore, Singapore
3 National University Hospital, Singapore, Singapore
4 National Public Health Laboratory, Singapore, Singapore
5 National University Health System, Singapore, Singapore
6 Makerere University, Kampala, Uganda

Background: Chickenpox vaccination in Singapore is not mandatory. At the National University Hospital (NUH), nosocomial transmission has led to a sentinel event and secondary cases. To prevent future transmissions, we studied the impact of Institutional Chickenpox Prevention Program at NUH.

Methods & Materials: NUH is a 1000 bedded tertiary care hospital in Singapore, with negative pressure isolation capability in 179 rooms and staff strength of approximately 7300. A retrospective audit of contact tracing data was done from January 2010 to June 2014, with probabilistic modeling to predict costs and number of future varicella infections. Data was obtained from clinical records, hospital information systems and the human resource department.

Results: There were 51 cases of chickenpox including 15 staff (Average 11.3 cases per year in total, 3.3 per year among staff). One index resulted in secondary transmission. The median number of staff contacts per index case was 4 (IQR: 2-13) with 0 (IQR: 0-2) being non-immune staff contacts. Direct costs and man hours lost in high risk areas (obstetrics and oncology), were significantly higher.

Current vaccination strategy A, where staff with negative or uncertain history of prior chickenpox, are screened with serum Varicella zoster virus immunoglobulin (VZV IgG) levels was compared with two scenarios B and C using probabilistic modeling, (B: VZV IgG for all existing and new staff; C: VZV IgG for existing staff with negative history and all new staff). After 10 years, expected number of chickenpox infections per year are 3, 1, and 2 under Strategies A, B and C respectively. Number of susceptible healthcare workers is 744.6 for A, 109.5 for B and 355.5 for C. Cumulative costs for Strategies B (599048 SGD) and C (496752 SGD) are 65% and 37% higher as compared to Strategy A.

Conclusion: There is need for a socio-culturally and architecturally suitable IC at the country’s main international access point and the capital city. Infectious disease units should be created in all national hospitals and should be well designed. I made designed

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Cultural rationale and architectural designs of Isolation Centres (ICs): A case of dangerous pathogens such as Ebola

G. Nakibaala
Makerere University, Kampala, Uganda

Background: Socio-cultural and Architectural suitability of a medical facility are very key to infection prevention and control. ICs should accommodate the well-being of the users. From the recent Ebola outbreak in West Africa, culture played a significant role to the spread of the disease. ICs should be designed cognisant of the risks of spread of disease such as Ebola through socio-cultural practices and also architectural unsuitability. Therefore the space designed for this function should be well thought through to achieve the two contradictory statements. When ICs are poorly designed, they may cause more harm than good because they may lead to infection of even the medical workers and surrounding communities. They are also completely useless and a complete waste of the resources. The objectives of the study are: - 1. To examine the socio-cultural and architectural suitability of ICs. 2. To design ICs that are socio-cultural and architecturally suitable. 3. To establish factors that hinder socio-cultural and architectural suitability.

Methods & Materials: The research covered the ICs at Entebbe the country’s main entry point and Kampala the country’s capital city, Uganda. This is because infectious diseases normally spread from country to country and also we have seen the impact of such infection on capital cities unlike the usual that is normally in rural areas. I carried out interviews and discussions with key persons. I did desk study of the drawings, I physically visited the centres and also took part in VHF and EDPs trainings.

Results: The existing isolation centres and medical facilities are not socio-culturally and architecturally adequate thus a risk to infection prevention and control. They are also unfriendly to the users thus resistances for staff and also for patients to be taken there.

Conclusion: There is need for a socio-culturally and architecturally suitable IC at the country’s main international access point and the capital city. Infectious disease units should be created in all national hospitals and should be well designed. I made designed