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| Imperial College London News Release  Under embargo until  20.00hrs GMT  Monday 31 January 2011  **Boys predominantly pass on flu to other boys and girls to girls, according to a new study of how swine flu spread in a primary school during the 2009 pandemic, published today in the journal Proceedings of the National Academy of Sciences. The results also suggest that flu transmission is most intensive between children of the same class, but that sitting next to an infected person does not significantly increase a child’s risk of catching flu. The data will help researchers to model how epidemics spread and how interventions such as school closures can help contain an outbreak.**  In the study, researchers from Imperial College London, the US Centers for Disease Control and Prevention (CDC) and the Pennsylvania Department of Health analysed how social networks influenced the spread of H1N1 pandemic flu in an elementary school in Pennsylvania.  The results show that children are about three times more likely to transmit flu to children of the same gender than to children of the opposite gender. The researchers also found that the transmission rate is about five times higher between classmates than between children in a different class in the same grade, and about 25 times higher than between children in different grades. However, sitting next a child with flu does not significantly raise a child’s risk of catching it.  The study involved 370 pupils (81 per cent of children in the school) from 295 households. The researchers collected extensive data from seating charts, school timetables, bus schedules, nurse logs, attendance records and questionnaires. Although it is impossible to determine exactly who caught flu from whom, the researchers used sophisticated statistical methods to probabilistically reconstruct the pattern of spread and estimate the rates of transmission in different settings.  “Mathematical models are useful for predicting how outbreaks will spread, but in order to make the models accurate, we need to supply them with data about how disease spreads in the real world,” said [Dr Simon Cauchemez](http://www1.imperial.ac.uk/medicine/people/s.cauchemez/), the lead author of the study from the [Medical Research Council Centre for Outbreak Analysis and Modelling](http://www1.imperial.ac.uk/medicine/about/divisions/publichealth/ide/outbreaks/) at Imperial College London. “This is one of the most comprehensive studies to date on how a flu epidemic spreads between children in school, and it tells us a great deal about how social networks influence transmission.  “The data from this study will help us make more accurate models, which can help public health officials to handle epidemics effectively. For example, these new models could help us better understand whether and when it would be appropriate to close a school, or whether it might be better to close individual classes or grades.”  The school that was studied in this project closed 18 days after the outbreak began, when 27 per cent of pupils had already shown symptoms. According to the analysis, transmission rates were falling at this stage, and closing the school probably had little impact on the spread of the epidemic.  Dr David Swerdlow, Senior Advisor for Epidemiology and Emergency Response, National Center for Immunization and Respiratory Diseases, at the CDC, said: “This was a unique opportunity at the inception of the 2009 influenza A (H1N1) pandemic to learn about transmission in social networks. The investigation demonstrates the benefits of partnerships as the collaboration included Imperial College, London, the Pennsylvania Department of Heath, and CDC.” The study was funded by the Medical Research Council, the Bill and Melinda Gates Foundation, the NIGMS MIDAS initiative, the EU FP7 FluModCont project, Research Councils UK, Pennsylvania Department of Health, and the CDC.  **For further information please contact:**  Sam Wong  Research Media Officer  Imperial College London  e-mail: [sam.wong@imperial.ac.uk](mailto:sam.wong@imperial.ac.uk)  Telephone: +44 (0)207 594 2198  Out of hours duty Press Officer: +44 (0)7803 886 248  **Notes to Editors:**  1. Journal reference: S Cauchemez et al. “Role of social networks in shaping disease transmission during a community outbreak of 2009 H1N1 pandemic influenza.” Proceedings of the National Academy of Sciences, 31 January 2011.  **2. About Imperial College London** Consistently rated amongst the world's best universities, Imperial College London is a science-based institution with a reputation for excellence in teaching and research that attracts 14,000 students and 6,000 staff of the highest international quality. Innovative research at the College explores the interface between science, medicine, engineering and business, delivering practical solutions that improve quality of life and the environment - underpinned by a dynamic enterprise culture.  Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all continues today, with current focuses including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy and address security challenges.  In 2007, Imperial College London and Imperial College Healthcare NHS Trust formed the UK's first Academic Health Science Centre. This unique partnership aims to improve the quality of life of patients and populations by taking new discoveries and translating them into new therapies as quickly as possible.  Website: [www.imperial.ac.uk](http://www.imperial.ac.uk)  Twitter: [www.twitter.com/imperialspark](http://www.twitter.com/imperialspark)  Podcast: [www.imperial.ac.uk/media/podcasts](http://www.imperial.ac.uk/media/podcasts)  **3. About Medical Research Council** For almost 100 years the Medical Research Council has improved the health of people in the UK and around the world by supporting the highest quality science. The MRC invests in world-class scientists. It has produced 29 Nobel Prize win ners and sustains a flourishing environment for internationally recognised research. The MRC focuses on making an impact and provides the financial muscle and scientific expertise behind medical breakthroughs, including one of the first antibioti cs penicillin, the structure of DN A and the lethal link between smoking and cancer. Today MRC funded scientists tackle research into the major health challenges of the 21st century.   Website: [www.mrc.ac.uk](http://www.mrc.ac.uk) |