1056-92-1411 **Michel Tchuenche*** (`jtchuenc@uoguelph.ca`), Department of Mathematics and Statistics, University of Guelph, 50 Stone Road East, Guelph, ON N1G 2W1, Canada, **A.P. Galvani**, Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, CT, **L. Ancel-Meyers**, Section of Integrative Biology &, Institute for Cellular and Molecular Biology, The University of Texas at Austin, Austin, TX 78712, and **Chris Bauch**, Department of Mathematics and Statistics, University of Guelph, Guelph, Guelph, ON N1G 2W1, Canada. *Outbreak control through voluntary first-order and second-order ring vaccination.* Preliminary report.

In ring vaccination, the contacts of an index case are identified and vaccinated. This has been applied in modelling the control of various infectious diseases. However, a form of ring vaccination where both contacts of index cases and some fraction of the contacts of the contacts of the index cases (second-order contacts) has not been explored. This may be a successful policy option for diseases where individuals are infectious before exhibiting symptoms, such as influenza, in health care systems with well-developed contact tracing capabilities. We derive and analyze a simple mathematical model that represents the conditions for control of an infectious disease through first-order and second-order ring vaccination, where individuals are free to choose whether or not to vaccinate and decide according to utility (health) maximization in the context of the vaccination decisions of others with whom they are in contact. (Received September 21, 2009)

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