

# Vaccines, Therapeutics & Travel Medicine: Influenza & Infectious diseases

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## New challenges for travel medicine and infectious disease surveillance: The increasing participation of emerging countries in international travel framework

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In this new century, international travel achieves global spread and huge numbers with more than 1 billion people travelling in all world destinies. This increase in travelers' numbers was also concomitant with global alerts for respiratory (n=10), viral (n=8) and vector borne diseases (n=21). Countries and international communities were aware of those outbreaks and each one defined policies to promote health safety during travelling. Recently emergent countries as BRICS present a dilemma of a recent past of huge endemic diseases aside to new health and economic development with a recent increase of their citizens for almost 50% of international travelers. Policies for health safety control differed between countries. Schengen area imposes mandatory health insurance without travel restriction, USA opts for long term visa and some countries as Japan use only travel restricted visa. In order to clarify the effects of those policies in health for travelers and countries, we compare health insurance data from each country, looking for their relationship with influx and cost of travelers to each area, using Brazilian travelers' data as a model. We show that the mandatory health insurance causes a negative effects on influx and cost of travel in receptive countries as compared to long term visa receptive areas, which presented an accelerated influx of travelers, while short time visa countries results unreceptive for travelers. Despite those diverse policies, health insurance claims per traveler were similar in all areas showing that 21<sup>st</sup> Century Brazilian travelers had the same health than world usual travelers. Countries health were also affected by huge travel flux with several outbreaks, specially respiratory or vector borne virus, dependent of a susceptible population but the source of the outbreak was independent of the receptive country. Polynesian Zika Virus and European Measles was introduced in outbreaks in Brazil and transmitted to other countries as USA or returning to Europe, showing a worldwide transmission network. We conclude that we need a new policy for safe health during short time travel involving not only long term visa but also the implementation of huge vaccine coverage for lowering susceptible population in receptive countries, a goal which is not achieved with mandatory health insurance.

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## Point of care molecular diagnostic devices for detecting influenza infections

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Influenza infections are commonly associated with high morbidity and mortality. Conventional diagnostic methods often require professional laboratory scientists and specialized laboratory facilities. Therefore, these conventional diagnostic methods are often time consuming and quite expensive. Quick and rapid detection by the patient's bedside can greatly improve the management of illness and reduce economic burden. A variety of point of care diagnostic devices has been developed to rapidly test for infectious diseases. One of them is an all polymer microfluidic system with a functionalized conductive polymer (PEDOT-OH:TsO) microelectrode array. It can detect influenza virus (H1N1) in less than 15 minutes. Another device called the Nanosphere Verigene platform got FDA approval for 5 infectious disease assays, including the respiratory virus plus (RV+ test). These devices produce accurate results and are simple to use. However, there is still a need to develop completely disposable devices that do not require equipment maintenance, lower the cost of these devices, monitor their accuracy in order to make these devices more widely available in the future.

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