

Marc Shaw
Claire Wong *Editors*

The Practical Compendium of Immunisations for International Travel

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‘When going on a journey it is not just the strength of a man’s legs, but the provisions he prepares for the trip’

—Abbot Kaoze (Dr Congo, 1890)

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Preface

Over one billion overseas visits are made by travellers worldwide each year to a myriad of destinations and for a huge variety of reasons. Each traveller will face different dangers which require individualised risk assessment and appropriate preventative advice. As such, travellers' health and medicine is an evolving, multi-faceted specialty requiring travel health professionals to be knowledgeable and confident in advising travellers.

A major focus of travel medicine is vaccines and a knowledge of vaccinology is essential. Health professionals providing travel health advice need to be able to access authoritative and current health information in order to make decisions about appropriate vaccines for travellers going abroad, often into quite remote regions. Decisions on vaccines to be administered are made on analysis of a traveller's projected itinerary, and the 'any number' of vaccine-preventable diseases that the traveller may encounter.

This book serves as a guide for travel health professionals in the primary care medical setting; however, the 'practical compendium of immunisations for international travel' will also be of benefit to all healthcare professionals. It provides comprehensive practical travel vaccine advice, together with solutions to situations when the administration of vaccines is unclear.

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Chapter 1

Introduction

Marc Shaw and Claire Wong

In 2014, over one billion travellers crossed international borders. Whilst most visited industrialised or developed countries, increasing numbers are seeking new destinations that challenge them. These may be in isolated, remote or hazardous regions that contribute to the desire for an adrenaline rush. They may be secluded beaches in well-known tourist resort countries that equally put the traveller well outside their comfort zone. Like the armies of Genghis Khan, the global traveller is looking for new conquests, and as such these travellers need learned and secure travel health advice before spending time in foreign climes, whether this be for days or months.

Immunisation and immunisation programmes are a major success within medical science, for they have become a public health intervention with an immense impact on both national and global health. The year 1796 can arguably be dated as the birth of immunisation, for on the 14th of May Edward Jenner inoculated 8-year-old James Phipps, the son of Jenner's gardener. Jenner had noted the common observation of the time that milkmaids were generally immune to smallpox, so he hypothesised that the pus in the blisters that milkmaids received from cowpox (a similar disease to smallpox) protected them from the more virulent smallpox.

Jenner took pus scraped from cowpox blisters that were on the hands of Sarah Nelmes, a milkmaid who had caught cowpox from a cow called Blossom.

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Incidentally Blossom's hide now hangs on the wall of the St George's medical school library. Jenner inoculated James in both arms on that historical day, and this subsequently produced in the boy a fever and some malaise but no full-on infection. Later, he injected Phipps with variolous material (usually by inserting or rubbing powdered smallpox scabs or fluid from pustules into superficial scratches made in the skin). This was the routine method of immunisation at that time previously used in China and the Middle East and brought to Europe and the United States in the 1700s. No disease followed the procedure, and the boy was later challenged again with variolous material with a similar negative result.

Since this fortuitous development of cowpox 'vaccination' by Edward Jenner, human longevity has been increased, and the burden of disease borne by mankind greatly reduced through the implementation of vaccination programmes.

Travellers' health and medicine is a young discipline that brings focus onto the health and safety of international travellers. Over the last two decades, especially, it has developed into a distinct domain with parameters of responsibility growing in response to the increasing numbers of overseas travellers. As the demand for travel health advice increases, so too has the number of travel medicine service providers.

The discipline is an energetic one that attracts health professionals because it counsels positive social prevention on health issues whilst travelling. With this development has come the need for guidelines and standards with respect to vaccines and immunisation. To this end, in order to provide appropriate, accurate and up-to-date advice for travellers, the travel health professional needs to:

- Be trained
- Have experience in travel
- Be familiar with the guidelines within which they may practise vaccinology

There are a wealth of textbooks and Web-based guidelines available including those from the World Health Organization (Switzerland), the Centers for Disease Control and Prevention (United States) and the National Travel Health Network and Centre (United Kingdom). Bodies such as the Faculty of Travel Medicine of the Royal College of Physicians and Surgeons of Glasgow, the Infectious Diseases Society of America and the International Society of Travel Medicine have published standards and guidelines for the practice of travel health and medicine.

Whilst these resources are valuable to all practitioners, they are generic for the limitations of the discipline. This compendium has an intended focus for those working in primary care travel health and medicine. It is essential that professionals have the availability of good practical information for their day-to-day practice. Vaccine availability, advice and recommendations do differ between countries, and this compendium seeks to bring uniformity of practice to those in Australia, New Zealand and Singapore. No such text is available for those practising in these regions. This is the first and as such needs to encompass the diverse field of 'vaccinology for dummies': vaccine types, names, contents, effects, and contraindications. They are all here and made simple to understand and easy to refer to, easily. The authors are practical individuals and this is the manner in which we edited this text.

We are grateful to the contributors to this compendium. They are some of the region's best writers in the specialty, and we are indeed fortunate to have their thoughts and contributions to what we trust will be a worthy tome on vaccine knowledge for primary care travel health and medicine.

Chapter 2

The Anatomy of Immunity

Helen Petousis-Harris

Key Points

- Vaccines introduce antigens to the immune system in the form of live, dead/inactivated or subunit vaccines.
- Successful immune responses occur following the appropriate response to a foreign antigen:
 - The first response is rapid and non-specific.
 - Specialised but non-specific cells transport and present the vaccine antigen to antigen-specific T cells and B cells within the lymph nodes and spleen.
 - The first wave of antibodies produced by plasma B cells is short-lived and of low affinity.
 - Immune memory takes at least 4 months to develop, but the antibody and memory cells that develop are of high affinity.
- Immune memory is long-lived and can be boosted by further doses of vaccine or natural infection.
- A memory (secondary) immune response is rapid and the antibody of higher magnitude and higher affinity than that produced in the primary response.
- Polysaccharide vaccines do not induce immune memory and are associated with hypo-responsiveness to later doses. Conjugate vaccines overcome these problems.

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