TOWARD A TRANSLATIONAL EPIDEMIOLOGY OF RELIGION: Challenges and Applications

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The Center for Spirituality, Theology, and Health, Duke University School of Medicine, Durham, NC, April 11, 2023.

BAYLOR UNIVERSITY

Annals of Epidemiology 75 (2022) 25–31

Contents lists available at ScienceDirect

Annals of Epidemiology

journal homepage: sciencedirect.com/journal/annals-of-epidemiology

Review article

Toward a translational epidemiology of religion: Challenges and applications

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ARTICLE INFO

Article history:
Received 4 February 2022
Revised 12 July 2022
Accepted 30 August 2022
Available online 2 September 2022

Keywords:
Epidemiology
Public health
Religion
Spirituality
Translational medicine

ABSTRACT

This paper explores the concept of translational epidemiology in the context of epidemiologic studies of religious determinants of morbidity and mortality. Despite a research literature of, by now, thousands of published studies, many in top-tier medical and public health journals, some resistance remains to full acceptance of this work. A principal reason may be the failure of investigators to make the case for real-world applications of epidemiologic findings on religious risk or protection for subsequent personal or population health, in keeping with the definition of translational epidemiology. To remedy this, a case is made for a translational epidemiology of religion. Three types of translation are proposed. The first two recall the standard definition of translational medicine as "from bench to bedside," in this instance two types of bedside encounters, pastoral and clinical. The third application is to public health practice, involving multiple public health professions and specialties. As with other substantive topics within psychosocial epidemiology, research on population-health outcomes of religious exposures provides information that can be applied to development of health promotion and disease prevention programs and formulation of health policy. But this can happen only if investigators give more attention to enumerating potential uses of their findings.

Introduction

The longstanding history and scope of epidemiologic analyses of religious exposure variables goes back further in time than perhaps most epidemiologists are aware. First summarized in detail in the 1980s [1,2], these studies extend back to the 1800s and encompass outcomes assessing overall and cause-specific morbidity and mortality for scores of diseases, including almost every cancer site and almost every major psychiatric diagnosis. The nearly dozen analyses by George Comstock and associates at Johns Hopkins [3], for example, all published in top-tier journals, are indicative of the seriousness with which this subject has been engaged among well known and reputable figures in academic medicine and epidemiology. Yet this issue remains somewhat contentious, for reasons related to legitimate concerns over the jarring intrusion of subjective and highly charged content about spirituality and human consciousness into scientific deliberation [4], as well as the persistent confounding of population-based studies of religion and health outcomes with controversial experimental trials of phenomena such as distant prayer and alternative healing [5]. The epidemiologic literature on population-health impacts of reliable measures of religious behavior and identity does not broach anything like that, and in most respects is garden-variety psychosocial epidemiology. But perhaps because of concerns over the term *religion* this literature still understandably raises eyebrows in some quarters within our profession.

These issues have been addressed in detail over the past couple decades, and the contentiousness over this subject within medicine and epidemiology has faded considerably, although not entirely. A principal reason for residual hesitation, even in light of substantial empirical evidence, is a general failure to make the case cogently and persuasively for the application of this information to medicine and public health. By that is meant the lamentable fact that while lots of data have been produced, including solid descriptive epidemiology, replicable analytical epidemiology, and even efforts at identifying mediating or explanatory mechanisms

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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https://doi.org/10.1016/j.annepidem.2022.08.053
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ELSEVIER

Volume 79
March 2023

ISSN 1047-2797
ANNPE3

Annals of Epidemiology

In This Issue

ACE AMERICAN COLLEGE OF EPIDEMIOLOGY

How do we get from population-health data on the risk or protective effects of religious identity & participation to real-world applications?

What do we do with all of these data?

Does any of this matter?

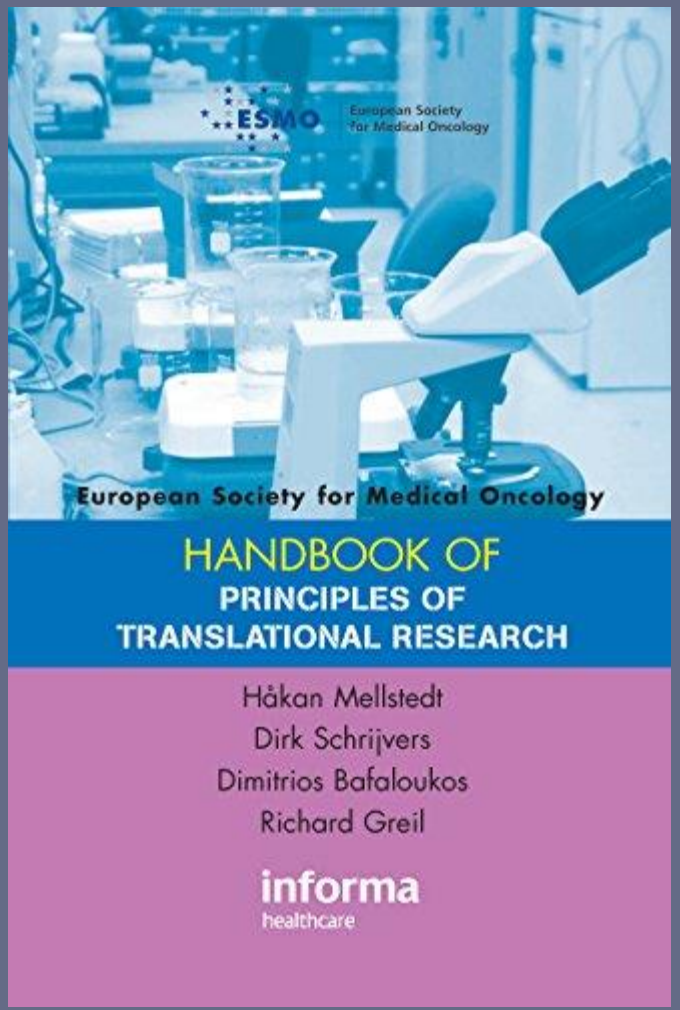
OUTLINE

1) Translational epidemiology
2) Epidemiology of religion
3) Three types of translational epidemiology of religion

1. Translational epidemiology

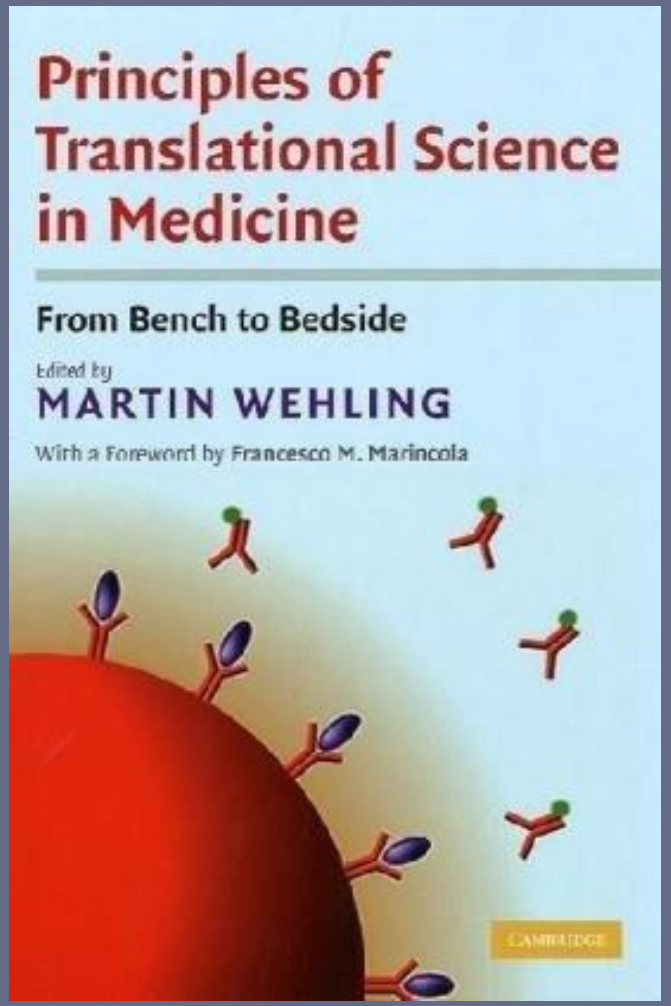
Translational Research

- Term first used in the mid 1980s
- >1.5 million hits on Google Scholar
- Practical application of:
  - (a) scientific discoveries to
  - (b) producing knowledge & solving problems
- Referenced in relation to science & technology, engineering, education, biomedicine, & other fields



Translational Medicine

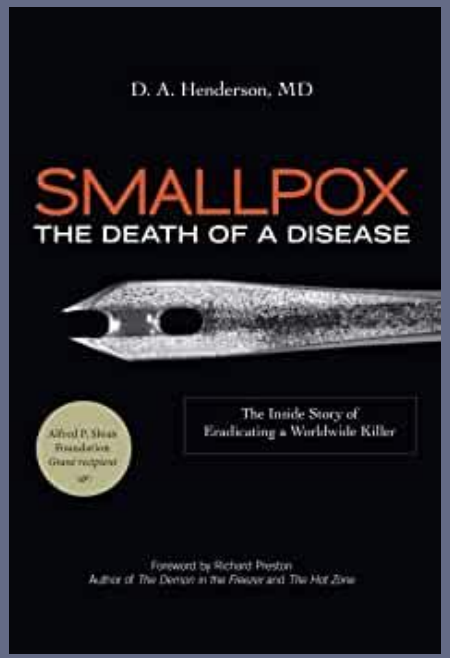
- Term first used in the 1990s
- >59,000 hits on PubMed
- Bridges from:
  - (a) preclinical (i.e., basic science, biomedical, bench, wet) research to
  - (b) clinical (D&T&P) applications
- Applies research "from bench to bedside" or "from lab to clinic"



Translational Medicine: *Example*

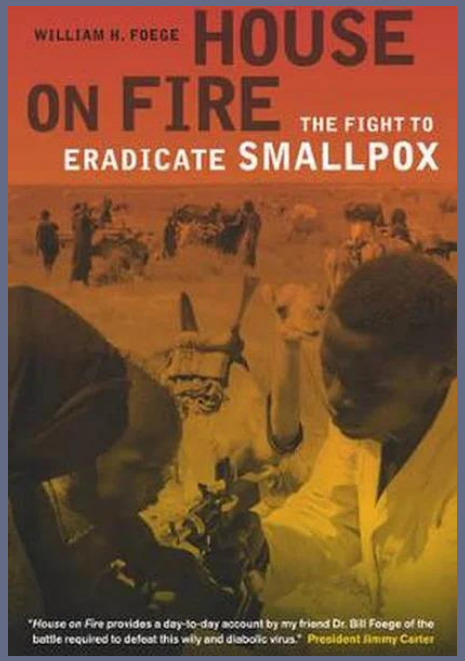
From bench . . .

Vaccine research
(D.A. Henderson, Johns Hopkins)



. . . to bedside*

Smallpox eradication
(Bill Foege, Emory & CDC)



**or village, in this instance*

National Institutes of Health

NATIONAL CENTER FOR ADVANCING TRANSLATIONAL SCIENCES

Established in 2011
Proposed by Dr. Francis Collins
FY 2022 budget = $879 million

Translational Epidemiology

- Term first used in ~2010
- >1,500 hits on PubMed
- Bridges from:
  - (a) epidemiologic research findings to
  - (b) the care of individuals & populations
- Applies research "from scientific discovery to population or community health"

American Journal of Epidemiology
Published by Oxford University Press on behalf of the Johns Hopkins Bloomberg School of Public Health 2010.
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Vol. 172, No. 5
DOI: 10.1093/aje/kwq211
Advance Access publication:
August 5, 2010

Commentary

The Emergence of Translational Epidemiology: From Scientific Discovery to Population Health Impact

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Initially submitted January 14, 2010; accepted for publication March 30, 2010.

Recent emphasis on translational research (TR) is highlighting the role of epidemiology in translating scientific discoveries into population health impact. The authors present applications of epidemiology in TR through 4 phases designated T1–T4, illustrated by examples from human genomics. In T1, epidemiology explores the role of a basic scientific discovery (e.g., a disease risk factor or biomarker) in developing a "candidate application" for use in practice (e.g., a test used to guide interventions). In T2, epidemiology can help to evaluate the efficacy of a candidate application by using observational studies and randomized controlled trials. In T3, epidemiology can help to assess facilitators and barriers for uptake and implementation of candidate applications in practice. In T4, epidemiology can help to assess the impact of using candidate applications on population health outcomes. Epidemiology also has a leading role in knowledge synthesis, especially using quantitative methods (e.g., meta-analysis). To explore the emergence of TR in epidemiology, the authors compared articles published in selected issues of the *Journal* in 1999 and 2009. The proportion of articles identified as translational doubled from 16% (11/69) in 1999 to 33% (22/66) in 2009 ($P = 0.02$). Epidemiology is increasingly recognized as an important component of TR. By quantifying and integrating knowledge across disciplines, epidemiology provides crucial methods and tools for TR.

epidemiology; genomics; medicine; public health; translational research

Abbreviations: HuGE, human genome epidemiology; HuGENet, Human Genome Epidemiology Network; TE, translational epidemiology; TR, translational research.

Editor's note: *An invited commentary on this commentary appears on page 525, and the authors' response is published on page 528.*

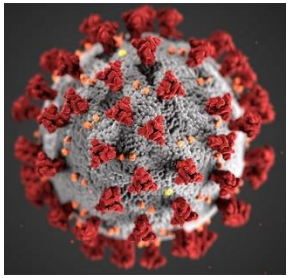
Translational research means different things to different people, but it seems important to almost everyone.
S. H. Woolf (1, p. 211).

In a recent editorial launching the new journal *Science Translational Medicine*, Dr. Elias Zerhouni, former director of the National Institutes of Health, remarked that despite decades of advances in our understanding of human biology and the emergence of powerful new technologies, such as genomics, the transformation of scientific discoveries into effective health interventions continues to elude us (2). There is daunting complexity when applying basic discoveries and experimental approaches to treating and preventing human disease, requiring a strong translational research (TR) agenda. He stressed the need for "more and better TR, both for the sake of our patients and because much of the research funding . . . comes from the primary expectation of the public that such scientific investigations will reduce the burden of disease" (2, p. 1). Translation of promising scientific discoveries into day-to-day practice is slow and uncertain (3), with only a few scientists willing to venture into the translation gap, sometimes referred to as the "valley of death" (4, p. 840). Perhaps no field has generated higher expectations, deeper frustrations, and more "translation anxiety" than advances in human genomics. In 2003,

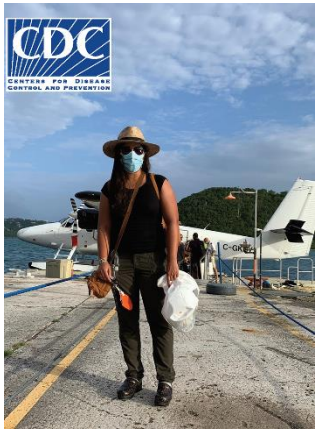
Translational Epidemiology: *Applications*

Applications to Population & Community Health

- Knowledge about risk factors & prevention
- Contributions to vital statistics
- Planning behavioral interventions & programs
- Health services planning & policymaking
- Environmental health policies
- Innovative medical treatments
- etc.



EPIDEMIOLOGY: Definition



"THE STUDY OF THE ***DISTRIBUTION*** AND ***DETERMINANTS*** OF HEALTH-RELATED STATES OR EVENTS IN SPECIFIED POPULATIONS, AND THE ***APPLICATION*** OF THIS STUDY TO CONTROL OF HEALTH PROBLEMS."

JOHN M. LAST, *A DICTIONARY OF EPIDEMIOLOGY*

Deconstructing the Definition of Epidemiology

- **"Distribution"**
  (descriptive epidemiology)
- **"Determinants"**
  (analytic epidemiology)
- **"Application"**
  (applied epidemiology)

- **How much of this is out there, by PPT?**
- **What are its causes or antecedents or predictors?**
- **What do we do with this information to address (public) health issues?**

Applied Epidemiology

Translation is not just about developing new treatments or interventions but also about communicating findings to the constituencies that can make use of them.

Applying epidemiologic findings on religion to address (public) health issues requires outreach to at least 3 populations, the "3 P's"

Pastors

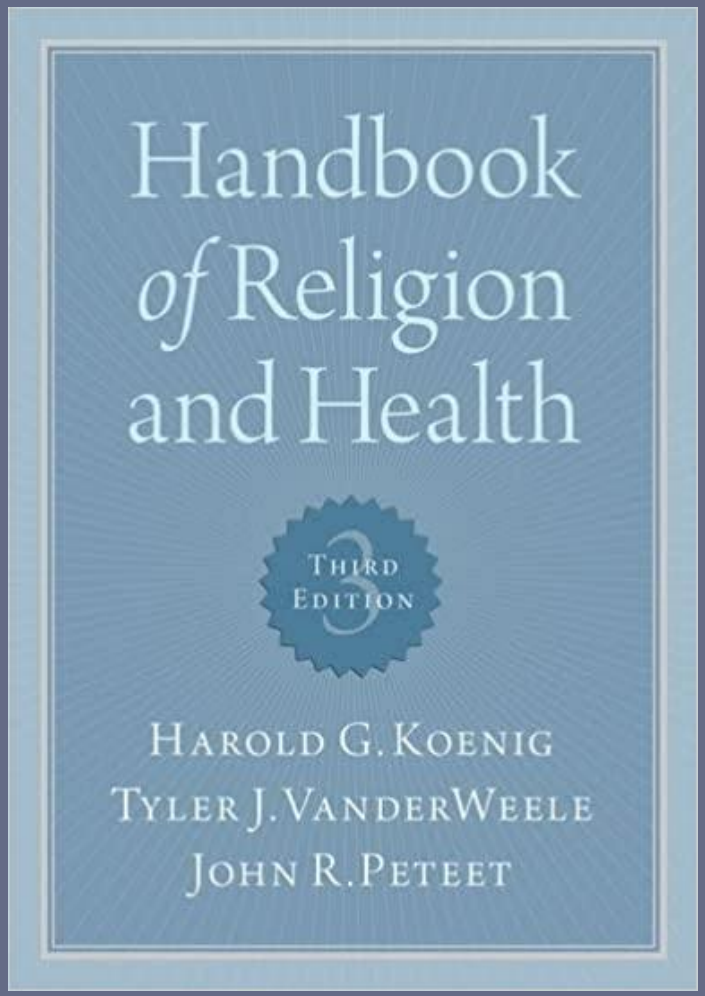
Physicians

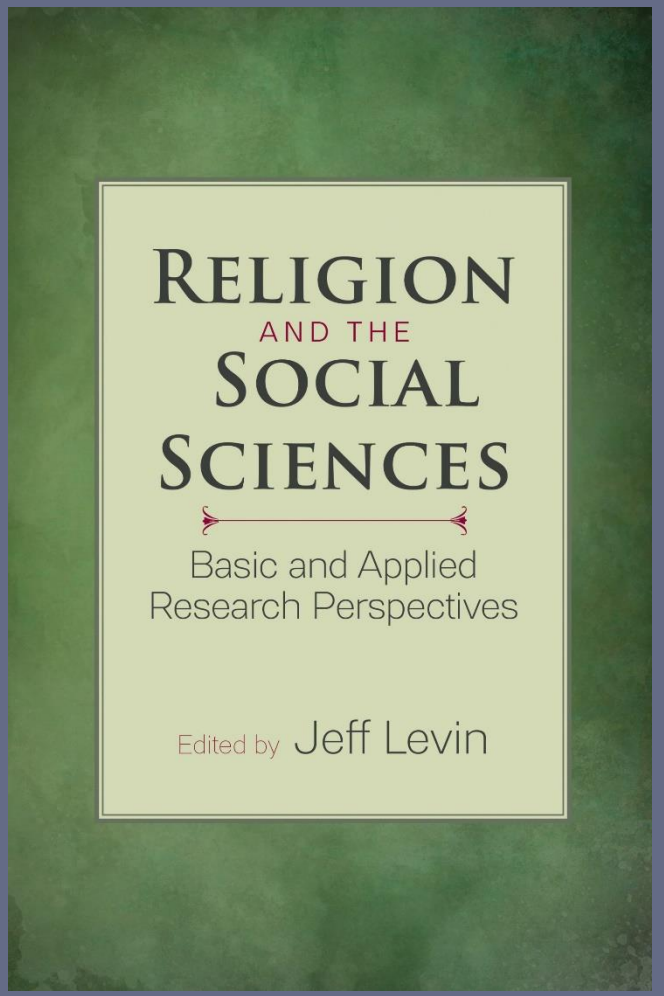
Public health professionals

{We'll come back to this shortly.}

2. Epidemiology of religion

Epidemiology of Religion: *Resources*





Epidemiology of Religion: *Summary of the Literature**

Disease entity	Positive (salutary) findings for religion
Heart disease morbidity & mortality	47 of 64 studies (73.4%) pos. findings
Hypertension & cerebrovascular disease	55 of 87 studies (63.2%) " "
Cancer morbidity & mortality	64 of 84 studies (76.2%) " "
All-causes mortality	92 of 116 studies (79.3%) " "
Self-rated health	44 of 70 studies (62.9%) " "
Pain & somatic symptoms	50 of 118 studies (42.4%) " "
Physical disability	30 of 64 studies (46.9%) " "
Depression	317 of 459 studies (69.1%) " "
Anxiety	170 of 314 studies (54.1%) " "

**Based on the first two editions of the Koenig et al. handbook.*

3. Three types of translational epidemiology of religion

Translational Epidemiology of Religion: *Three Types of Translation*

Outreach to . . .	Type of translation
1) Pastors	1) **Pastoral translation** ➢ Application to encounters within medical care facilities, as well as privately, e.g. spiritual counseling
2) Physicians	2) **Clinical translation** ➢ Application to hospital, outpatient, & primary care medical encounters
3) Public health professionals	3) **Public health translation** ➢ Application to HPDP, public health policy, environmental activism, & global health development

Pastoral Translation

Issues & Challenges	Recommendations
• How to communicate findings to frontline pastoral professionals	• Detail implications of population-wide findings for individual patient encounters
• How to provide information useful to spiritual counselors	• Discuss relevance of findings to the faith lives of people facing physical & mental health challenges
• How to marshal evidence supporting CPE & hospital chaplaincy in an era of cutbacks	• *Greater focus on studies of clinical-epidemiologic & health services outcomes*

Clinical Translation

Issues & Challenges	Recommendations
• How to define research questions that make biological sense	• Seek out collaboration with clinicians or bench scientists
• How findings are worded	• Use correct medical terminology
• How findings are made relevant	• *Spell out clinical implications (i.e., for D, T, or P)*
• How to identify meaningful follow-up research	• *Consult with clinicians before proposing new research agendas*

Public Health Translation

Issues & Challenges	Recommendations
• How to identify priorities for research on risk & protective factors	• Focus on outcomes responsible for the greatest proportional morbidity or mortality
• How to inform behavioral change & other HPDP interventions	• Work with congregational & denominational committees to establish faith-based programs
• How to inform public health & environmental policymaking	• *Outreach to legislators, NGOs, think-tanks, media contacts, & civil-society sector*

Ethics of Translation: *Questions*

- **Is it unethical not to attend to translation?**
  - ✅ **YES** ***(otherwise why do the work?)***
- **Are there consequences to failing to adequately translate findings?**
  - ✅ **YES** ***(study findings won't be applied or will be buried)***
- **Are there consequences to mis-communicating findings to intended audiences?**
  - ✅ **YES** ***(research may end up wasted or doing harm)***

TAKE-HOME POINT

Findings from population-health research on religion are of greatest use only if they can be communicated to pastors, physicians, and public health professionals for purposes of translation.

"It is the responsibility of those of us involved in today's biomedical research enterprise to translate the remarkable scientific innovations we are witnessing into health gains for the nation. . . . At no other time has the need for a robust, bidirectional information flow between basic and translational scientists been so necessary."

Elias A. Zerhouni, M.D.
***NEJM* 2005; 353: 1621-23.**
Former Director of the NIH


ILLNESS
CLINICAL
FEMALE
PROTECTION
ARM
FEVER
IMMUNIZATION
SPECIALIST
KID
VIRUS
INFECTION
PROFESSIONAL
INFANT
PATIENT
INJECTION
PHTHERIA
THERAPY
INFECTIOUS
HEALTH
UBERCULOSIS
EPIDEMIOLOGY
EDICAL
BABY
VACCINE
MEDICINE
VACCINATION
DRUG
SYRINGE
DOCTOR
CHILD
HEALTHCARE
IMMUNITY
CARE
DISEASE
NURSE
HEPATITIS
NEEDLE
CLINIC
FLU
TETANUS