

BOOK REVIEWS

Annual Review of Public Health, 2022. Jonathan E. Fielding, Ross C. Brownson and Lawrence W. Green (eds). Annual Reviews, 1875 S. Grant Street, Suite 700, San Mateo, California 94402, USA. Vol. 43. xvi + 611 pages. Price: US\$ 118.00.

As a young post-graduate student, I was fascinated by several landmark studies on diabetes in the Pima Indians in North America. At that time, my attention was drawn to the physiological investigations which provided so much new information – the antecedents of diabetes in this native American group hardly engaged me. This contrasts with two articles in the present *Annual Review* which look at the historical and political context of diabetes in American Indians and Alaska natives and position the current health problems in these populations within a social and ecological framework. The article by Lucero and Roubideaux on ‘Advancing diabetes prevention and control in American Indians and Alaska Natives’ provides a current epidemiological context of diabetes in these populations, but then succinctly explores historical antecedents of the disease in relation to political and policy decisions. This, latter issue is reviewed more extensively in the article by Kruse *et al.* on the ‘The Indian health service and American Indian/Alaska Native health outcomes’ which includes a fascinating historical account of the impact of colonization, and subsequent federally mediated health care efforts for ‘Indians’ to the final evolution of a more autonomous ‘Indian Health Service.’ While these articles might appear to be of interest only to a specific region of the world, I believe that it highlights the importance of contextualizing current health problems in relation to historical events – this is of relevance to all people and places. The articles highlight how single policy decisions in the past have had generational health impacts and are a timely reminder on the need to evolve more people-centred policies which consider inputs from the people affected by those policies. These articles, are thus, to my mind more applicable to a wider readership.

Bershteyn and colleagues write about ‘Real-time infectious disease modelling to inform emergency public health decision making’. Modelling of disease in real time has several implications which have emerged all too clearly in the present COVID pandemic. At a very basic level, the magnitude of the health problem can be delineated, but issues of the risk factors and magni-

tude of transmission can also be computed. For healthcare planners, these data help to formulate responses for containment, hospitalization and allocation of resources, among others. Costing of health interventions can be predicted and interventions altered in response to changing scenarios. I found this article very lucid and comprehensive and believe that it would be of interest to all students and practitioners of public health. Computerized data collection, analyses and dissemination have certainly come a long way from ‘Bills of Mortality’ posted at the cemeteries and then transferred to city clerks in epidemics in earlier centuries.

Another article which gripped my attention in part due to issues faced during the current pandemic was by Sood *et al.* on ‘Shifting the demand for vaccines: A review of strategies’. The authors critically review the literature on demand and acceptability of vaccines in relation to various factors including perceived vaccine safety, vaccine effectiveness, perceived disease severity, perceived risk of infection, societal norms and social pressure and trust in government, the health sector and other sources of information. The article also addresses ways to enhance vaccine uptake. While the factors involved in vaccine acceptance and uptake vary across regions and populations, there are common lessons that apply to all regions of the world.

A welcome departure from the excessively quantitative and positivist approach that characterizes some public health research is the article on ‘Qualitative research methods in chronic disease: Introduction and opportunities to promote health equity’ by Shelton and colleagues. While written in the specific context of health inequity, the article is an excellent primer for those who are unfamiliar with or wish to explore the role of qualitative methods in public health research. Thus, the authors outline the goals, sampling and analytical approaches to selected forms of qualitative enquiry including ethnography, grounded theory, phenomenology, narrative enquiry and case studies as well as the characteristics, strengths and weaknesses of qualitative data collection methods such as semi-structured interviews, focus groups, participant observation, document/archival review and participatory methods. There is an overwhelming focus on quantitative methods in training courses in public health research. This article asserts the need for constructive paradigms in specific areas of enquiry and emphasizes ‘the existence of multiple soci-

ally constructed perceptions and realities versus the existence of a singular objective truth’.

While the social determinants of health have received considerable coverage in medical literature, the commercialization of health and healthcare has not. So, it was with some interest that I read the article by Lee and Freudenberg on the ‘Public health roles in addressing commercial determinants of health’. The commercial determinants of health can be health-harming, for instance regarding alcohol, tobacco, and processed food, among many others, but may also be health promoting as for instance with innovations that lead to new medications or technologies. This article focuses on approaches to mitigate the harmful health effects of the commercial determinants of health. Using many examples from literature, the authors address strategies that include behavioural change, regulation of market and nonmarket business practices, fiscal policy strategies including taxation and financial incentives, citizen and consumer activism, and litigation and other legal remedies. I found the article quite captivating in terms of its scope, depth and balanced arguments.

The article by Ana Rouxon ‘Social epidemiology: Past, present, and future’ focuses on the production of disease, social stratification and health, and the policies and interventions that can be applied at the individual level and beyond in neighbourhoods, workplaces, communities, and society at large. While the frameworks presented were interesting, I found that a considerable and important body of literature outside of America was not covered. This may relate to the author’s need to focus on a specific region. For researchers interested in this area, it would therefore be necessary to apply the frameworks to their own regional data and context. A related article by Holt-Lunstad addresses ‘Social connection as a public health issue: The evidence and systemic framework for prioritising the “social” in social determinants of health’. Epidemiological data have revealed the inverse association of social connection and mortality as also the increased risk for coronary heart disease and stroke with poor social relationships. In addition, components of social connectedness (loneliness, social isolation, lack of social support) have been associated with various other physical health outcomes including diabetes, self-management, malnutrition, frailty in older men and vaccine uptake, among others. The article addresses the biological and behavioural pathways by which social connectedness

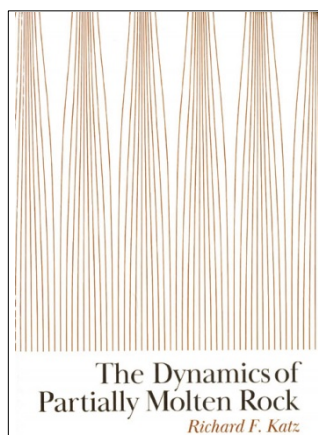
influences health and evaluates social connection as a causal determinant of health.

An article that I feel would have an extended readership is that by Vela and colleagues entitled 'Eliminating explicit and implicit biases in health care: Evidence and research needs'. This article is based on the assumption that healthcare providers hold negative explicit and implicit biases against marginalized groups, which have an important impact on the patient–doctor relationship, in institutionalized healthcare practices. Bias is reflected in the practice of stereotyping individuals based on race or community among others, but may also be so ingrained so that it is automatic and without intention. As an educator in medical field, I wondered, as I read the article how much this issue permeates our own healthcare system and to what extent medical students are influenced in this regard during their training in medical colleges as part of the informal or 'hidden curriculum.'

I have highlighted only a few of the many articles in this edition of the *Annual Reviews*. As in earlier years the articles are grouped under certain broad categories which include Epidemiology and Biostatistics, Social Environment and Behaviour, Environmental and Occupational Health, Public Health Practice and Policy and Health Services. In this edition, I found the articles engaging both in breadth and depth. Despite the ongoing COVID pandemic, it was nice to see a much broader coverage of public health issues. The inclusion of historical perspectives in several articles appealed to my own interest in the history of medicine, but they also speak of the need of addressing current health problems through an understanding of past events. Many articles have succinct summaries and also highlight 'knowledge gaps' – these are welcome components for students. It was gratifying to see qualitative research highlighted in several of the articles as also broader social-ecological frameworks. I have always looked forward to reading the new editions of the *Annual Review of Public Health* – the current edition left me self-reflective and satisfied.

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The Dynamics of Partially Molten Rock.

Richard F. Katz. Princeton University Press, Princeton, New Jersey 08540. 2022. xxii + 341 pages. Price: US\$ 75.00/£ 62.00. ISBN: 9780691176567.

Magmatism is a fundamental process of chemical and thermal evolution of the Earth and other planets. Partial melting of mantle peridotite is a typical situation in Earth's asthenosphere, the source of the prolific magmatism along mid-ocean ridges. Our knowledge of the asthenosphere derives from many disciplines and approaches. The asthenosphere was recognized as a geophysical low-velocity zone beneath the lithosphere based on seismological data, and geophysical techniques have greatly expanded and improved since. Petrologists and geochemists learn about the composition, dynamics, and evolutionary history of the asthenosphere by mineralogical and geochemical (including isotopic) studies of ocean-floor rocks, whether sampled *in situ* or exposed on land in ophiolites. Given that the Earth's upper mantle including the asthenosphere is a fluid on long time scales, and characterized by slow convection, yet another approach to understanding the asthenosphere is that of fluid dynamics. All these approaches are complementary; the ideal situation would be one in which specialists in one discipline or approach would understand the methods, results, uncertainties and potential pitfalls of other approaches.

This is a geologist's review of the book by Richard Katz, Professor of Geodynamics at Oxford University. The book deals with fluid dynamics, mechanics and rheology of the asthenosphere, coupled with petrological thermodynamics, geochemical transport and numerical modelling. A fundamental theme of the book is the nature and behaviour of liquid-crystal aggregates in the as-

thenosphere, in which a basaltic partial melt of mantle peridotite exists within pores of the unmolten residual peridotite (often harzburgite, and after high-degree melting, dunite). Parameters such as shear viscosity and permeability of this two-phase system, aided by stresses arising from plate tectonics, govern the segregation of basaltic liquid from residual peridotite, leading to large-scale magmatism at the mid-ocean ridges.

A range of fascinating research questions are addressed in the book. For example, how does magma move through the asthenosphere and adjust to varying physico-chemical conditions as it moves? What mechanical parameters govern the rate of buoyancy-driven melt transport? Is melt transport simply and purely vertical, and what forces and processes drive *lateral* melt transport? How does melt transport occur at the boundary between the asthenosphere (where porous flow dominates) and the lithosphere (where brittle fracture is required)? How do modal lithological variations in mantle rocks, implying varying degrees of mantle fusibility or fertility (i.e. basalt content), affect melting and melt transport? Under what conditions do crustal flow (creep) and melt-rock reaction increase or decrease permeability and thus melt transport? And how are these variations in mantle lithology, fusibility and the melt extraction processes reflected in the magmas erupted, say at mid-ocean ridges?

As mentioned by the author the book grew from a series of lecture notes, and covers the above topics in 15 chapters, each of which contains problems and exercises at the end. The chapters are: (1) Introduction. (2) A condensed history of magma/mantle dynamics. (3) A review of one-phase mantle dynamics. (4) Conservation of mass and momentum. (5) Material properties. (6) Compaction and its inherent length scale. (7) Porosity-band emergence under deformation. (8) Conservation of energy. (9) Conservation of chemical species-mass. (10) Petrological thermodynamics of liquid and solid phases. (11) Melting column models. (12) Reactive flow and the emergence of melt channels. (13) Tectonic-scale models and modelling tools. (14) Numerical modelling of two-phase flow. (15) Solutions to exercises. The last chapter is followed by a Bibliography and an Index. The book is necessarily highly mathematical, but while readers proficient in mathematics will enjoy it and benefit from it the most, others not so could still learn much from it. The author notes that the theory