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Title

Model-Based Demography: Essays on Integrating Data, Technique and Theory

Permalink

<https://escholarship.org/uc/item/5q99n7xz>

Journal

Canadian Studies in Population, 45(3-4)

ISSN

0380-1489

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Publication Date

2018

DOI

10.25336/csp29401

Peer reviewed

Model-based Demography: Essays on Integrating Data, Technique and Theory

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Dordrecht, Heidelberg, London, New York. Springer, 2018.

ISSN 1613-5520 ISSN 2197-9286 (electronic)

Demographic Research Monographs

ISBN 978-3-319-65432-4

ISBN 978-3-319-65433-1 (eBook)

DOI 10.1007/978-3-319-65433-1

Library of Congress Control Number: 2017951857.

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This open-access monograph by Tom Burch is a recent – and valuable – addition to a long-standing series of research monographs under the general editorship of James Vaupel that is produced by Springer in conjunction with the Max Planck Institute for Demographic Research (Rostock, Germany). It can be accessed and downloaded in whole or part at:

https://www.demogr.mpg.de/en/projects_publications/publications_1904/monographs/model_based_demography_5983.htm

The monograph consists of 200 pages organized into four major parts, with chapters 1 through 5 in the first part (I. *A Model-Based View of Demography*), chapters 6 through 10 in the second (II. *Some Demographic Models Re-visited*), and chapters 11 through 13 in the third part (III. *Teaching Demography*). The Final Part (IV. *Conclusion*) consists of Chapter 14, “Concluding Thoughts.”

The first chapter, “Demography in a New Key: A Theory of Population Theory” opens Part I (*A Model-Based View of Demography*) by providing an overview of and introduction to Burch’s primary argument, which is that a “model-based” view of science is the perspective that should be used in conceptualizing, researching and teaching demography. In the second chapter, “Data, Models, Theory and Reality: The Structure of Demographic Knowledge” lays groundwork for his argument, which is illustrated and supported in the three remaining chapters in Part I of the monograph, which cover topics regarding the use of simulation and differential equations in demography.

In Part II (*Some Demographic Models Re-visited*), Burch looks at several important frameworks extant in demography, including the cohort-component population projection model. In regard to the latter, he observes that it embodies a sound theory of population dynamics and is a good theoretical model, noting that its drawbacks relate to the way it was perceived and used, as an exclusively valid approach to population forecasting, often applied and interpreted in a mechanical manner.

In Chapter 11, Burch kicks off Part III of the monograph, *Teaching Demography*, with ten principles, which stem from his critique that contemporary social science labors under the burden of logical positivism, which provides a faulty view of the nature of science. It is worthwhile to list all ten principles here because they provide an insight into the monograph as a whole.

1. Put more emphasis on theory, that is, abstract models of population dynamics and demographic behavior. Teach demography as a body of theoretical knowledge, as well as a body of data, techniques, and descriptive findings.
2. Hold onto older and simpler – even ‘oversimplified’ – models insofar as they contain valuable insights and can help students begin to understand.
3. Put more emphasis on student activity in which they use theoretical models to analyze real-world – or at least realistic – problems and exercises.

4. Set problems and exercises that will lead students to face the limitations of the analytic tools they have learned and encourage them to try to think of improvements.
5. Teach or require the tools students need to work rigorously with the theoretical models.
6. Integrate formal demography ('techniques') and population studies ('substance') rather than teaching so-called 'technical demography' in completely separate courses or relegating it to an appendix, as is typical in many English language demographic texts.
7. Teach the basic principles of formal demography in every demography course, unless it can be assumed that students already know them.
8. Emphasize the general principles underlying many apparently disparate measures and models to make the teaching of formal demography more efficient.
9. For beginning students of demography especially, put less emphasis on data collection, errors in data, and precision in techniques.
10. Rely more heavily on visual representation of theoretical ideas and processes.

"Concluding Thoughts" is the title of the single chapter (14) in Part IV (*Conclusion*) of the monograph. Here, Burch argues that a model-based view will provide a liberating and more fruitful approach to theory, modelling, and demographic explanation.

Tom Burch's monograph can be viewed as a summary of the thoughts that he has assembled on population theory after many years of careful consideration and he ties them not only to theory, but to modelling and explanation, as well as to teaching. This monograph is an important, seminal contribution to the field of demography that is extremely well-written and organized. You should read this 'liberating' monograph, but beware that in so doing, your level of comfort with how the field is currently conceptualized, studied and taught will be disturbed and, possibly, forever altered.