Molecular Medicine May Lead to More People Living Longer, Staying Healthier, Retiring Later

Examining the impact of molecular medicine on health care and society between 2000 and 2050

**SUMMARY**


Molecular biology is the study of the basic processes of life (proteins, nucleic acids, viruses and cell components, as well as how genes influence the production of proteins).

The Brookings Institution is an independent, nonpartisan organization devoted to research, analysis, education and publication focused on public policy issues in economics, foreign policy and governance.

**Key Results**

The project achieved results in the following areas:

- The book discusses the problems, challenges and opportunities posed by a longer life span. According to one of the co-editors (Aaron), the book's general message is that increased longevity will produce a range of challenges, but these challenges will emerge slowly:
  - The sharp increase in the number of people who live to be 100 will not occur until the second half of the 21st century.
  - Public policies could offset the cost pressures of increased longevity by increasing the age of eligibility for pension and health benefits and encouraging later retirement.
  - How much medical expenses will increase is uncertain. Considerable evidence suggests that increases in medical spending resulting from increased longevity could be modest.
**Funding**

The Robert Wood Johnson Foundation (RWJF) provided $359,999 for this project, which ran from October 2000 to December 2003.

**THE PROBLEM**

Major improvements in medical care based on rapid advances in molecular biology are expected to extend life expectancy to 100 or above by 2050, and even higher later in the 21st century, according to many medical experts. Increased life expectancy will create many challenges and opportunities for policymakers, public health officials and society through its effect on local and global demographic trends, government taxation and spending, health care, the workplace, Social Security, Medicare, Medicaid and ethical and quality-of-life issues.

**THE PROJECT**

Researchers at the Brookings Institution in Washington and the University of Southern California, School of Medicine, in Los Angeles led an examination of probable advances in molecular biology between 2000 and 2050 and the potential impact of such advances on health care and on society.

Co-principal investigators Henry Aaron, PhD, a senior fellow in economic studies at the Brookings Institution, and William B. Schwartz, MD, a professor of medicine at the University of Southern California, School of Medicine, brought together 11 practicing scientists and public policy experts (economists, a psychologist and an ethicist) to write papers that would be published as chapters in a book on the impact of molecular biology on health and society.

Aaron and Schwartz held two meetings with the authors: in August 2001, at which authors presented general outlines, discussed potential problems and identified overlaps and gaps, and in April 2002 at which authors presented and discussed the papers. The authors then revised the papers for publication.

**RESULTS**

The project achieved results in the following areas:

- **Brookings Institution Press published** *Coping with Methuselah: The Impact of Molecular Biology on Medicine and Society in early 2004.* The book discusses the problems, challenges and opportunities posed by a longer life span. According to one of the co-editors (Aaron), the book's general message is that increased longevity will produce a range of challenges, but these challenges will emerge slowly:
— The sharp increase in the number of people who live to be 100 will not occur until the second half of the 21st century.

— Public policies could offset the cost pressures of increased longevity by increasing the age of eligibility for pension and health benefits and encouraging later retirement.

— How much medical expenses will increase is uncertain. Considerable evidence suggests that increases in medical spending resulting from increased longevity could be modest.

— The effect of increased longevity on saving, investment and international capital flows is highly uncertain and depends upon whether longevity is increased in most economically significant nations or only in the relatively well-to-do nations.

— The medical and biological advances that will contribute to increased longevity will create a host of ethical challenges that will confront policy makers, ordinary citizens and ethicists.

(See the Appendix for a list of the book's chapters and authors.)

Communications

Coping with Methuselah: The Impact of Molecular Biology on Medicine and Society is available for purchase on the Brooking Institute's website. See the Bibliography for details.

LESSONS LEARNED

The project director offered three lessons for the field.

1. **When commissioning papers for a book, provide clear specifications about content expectations.** The co-editors of Coping with Methuselah held two meetings with the authors, first to discuss the content of the papers and then to present and discuss the drafts, which helped provide these specifications. (Project Director)

2. **When commissioning papers for a book, expect the quality of the papers to vary.** For example, one draft chapter of Coping with Methuselah required such extensive revisions that the author withdrew from the project and the chapter was dropped from the book. (Project Director)

3. **It is very difficult to persuade busy people to work on an agenda that they have not fashioned themselves and to deliver promised papers on time.** In order to get authors to deliver their papers for the book on time, Aaron kept "pestering them, ideally in a manner that makes them feel a bit guilty." (Project Director)
AFTERWARD

Project staff are working on a manuscript on the public policy implications of a lengthening human life span.

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APPENDIX

Chapters and Their Authors

(Current as of the end date of the program; provided by the program’s management; not verified by RWJF.)

Coping with Methuselah: The Impact of Molecular Biology on Medicine and Society

"Introduction"
Henry J. Aaron (Co-project director), Brookings Institution, Washington, D.C.
William B. Schwartz, M.D. (Co-project director), University of Southern California, Los Angeles, Calif.

"The Impact of the Revolution in Biomedical Research on Life Expectancy by 2050"
John T. Potts, M.D., Massachusetts General Hospital and Harvard University, Boston, Mass.
William B. Schwartz, M.D. (Co-project director), University of Southern California, Los Angeles, Calif.

"Our Uncertain Demographic Future"
Henry J. Aaron (Co-project director), Brookings Institution, Washington, D.C.
Benjamin Harris, Brookings Institution, Washington, D.C.

"The Changing Face of Health Care"
Alan M. Garber, M.D., Stanford University, Stanford, Calif.
Dana Goldman, RAND, Santa Monica, Calif.

"Labor Market Effects of Dramatic Longevity Improvement"
Gary Burtless, Brookings Institution, Washington, D.C.
"The Impact of Major Improvements in Life Expectancy on the Financing of Social Security, Medicare, and Medicaid"
   John B. Shoven, Stanford University, Stanford, Calif.

"Ethical Aspects of Major Increases in Life Span and Life Expectancy"
   Alexander Capron, University of Southern California, Los Angeles, Calif.

"Increased Life Expectancy: A Global Perspective"
   Barry Bosworth, Brookings Institution, Washington, D.C.
   Benjamin Keys, Brookings Institution, Washington, D.C.

BIBLIOGRAPHY

(Current as of date of the report; as provided by the grantee organization; not verified by RWJF; items not available from RWJF.)

Books