



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

Abstract Book:

3rd Annual International Conference on
Public Health

19-22 June 2017, Athens, Greece

Edited by
Gregory T. Papanikos

2017

Abstracts
3rd Annual International
Conference on Public Health
19-22 June 2017, Athens, Greece

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Preface

This book includes the abstracts of all the papers presented at the 3rd Annual International Conference on Public Health, 19-22 June 2017, organized by the Athens Institute for Education and Research (ATINER). All ATINER's conferences are organized by the Academic Committee (<https://www.atiner.gr/academic-committee>). This conference has been organized with the assistance of the following academics, who contributed by chairing the conference sessions and/or by reviewing the submitted abstracts and papers:

1. Gregory T. Papanikos, President, ATINER.
2. Paul Contoyannis, Head, Health Economics & Management Research Unit, ATINER & Associate Professor & Director of Graduate Studies, McMaster University, Canada.
3. Margaret Brandeau, Professor, Stanford University, USA.
4. Steven Jonas, Professor Emeritus, Stony Brook University, USA.
5. Anthony Koutoulis, Head of School of Biological Sciences, University of Tasmania, Australia.
6. Peter Tompa, Professor, VIB Center for Structural Biology, Belgium.
7. Richard Grimes, Adjunct Professor, University of Texas Health Science Center at Houston, USA.
8. Roseane Maria Santos, Academic Member, ATINER & Associate Professor, South University School of Pharmacy, USA.
9. Sergio Ivan Prada Rios, Professor, University Icesi - Proesa, Colombia.
10. Leonas Valkunas, Professor, Vilnius University, Lithuania.
11. Pawel Kawalec, Assistant Professor, Jagiellonian University Medical College, Poland.
12. Taylor Robinson, Instructor, Gavilan College, USA.
13. Tolga Cavas, Professor, Uludag University, Turkey.
14. Semir Ozdemir, Professor, Akdeniz University, Turkey.
15. Lampros A. Pyrgiotis, President, Greek Society of Regional Scientists, Greece.
16. Vassilis Skianis, Research Fellow, ATINER.
17. Olga Gkounta, Researcher, ATINER.
18. Hannah Howard, Research Assistant, ATINER.

In total 34 papers were submitted by 40 presenters, coming from 19 different countries (Australia, Belarus, Belgium, Brazil, Canada, China, Colombia, Egypt, India, Nigeria, Philippines, Poland, Saudi Arabia, South Korea, Switzerland, Thailand, Turkey, UK and USA). The

conference was organized into 14 sessions that included a variety of topic areas such as financing public health, health education and more. A full conference program can be found beginning on the next page. In accordance with ATINER's Publication Policy, the papers presented during this conference will be considered for inclusion in one of ATINER's many publications.

The purpose of this abstract book is to provide members of ATINER and other academics around the world with a resource through which to discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the institute. ATINER was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet to exchange ideas on their research and consider the future developments of their fields of study.

It is our hope that through ATINER's conferences and publications, Athens will become a place where academics and researchers from all over the world regularly meet to discuss the developments of their discipline and present their work. Since 1995, ATINER has organized more than 400 international conferences and has published nearly 200 books. Academically, the institute is organized into seven research divisions and 38 research units. Each research unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the administration staff of ATINER for putting this conference and its subsequent publications together.

Gregory T. Papanikos
President

FINAL CONFERENCE PROGRAM
3rd Annual International Conference on Public Health,
19-22 June 2017 Athens, Greece

PROGRAM

Conference Venue: Titania Hotel, 52 Panepistimiou Avenue, Athens, Greece

C O N F E R E N C E P R O G R A M

Monday 19 June 2017

08:00-09:00 Registration and Refreshments

09:00-09:30 (Room D-10th Floor) Welcome and Opening Address

Gregory T. Papanikos, President, ATINER.

**09:30-11:00 Session I (Room B-1st Floor):
Systems**

Chair: Vassilis Skianis, Research Fellow, ATINER.

1. Steven Jonas, Professor Emeritus, Stony Brook University, USA. Ending the “Drug War”; Solving the Drug Problem: The Public Health Approach.
2. Rolando Penaloza, Director, Pontificia Universidad Javeriana, Colombia & Juan Sebastian Ortegón Ocampo, Researcher, Pontificia Universidad Javeriana, Colombia. Recoveries to the General System of Social Security in Health in Colombia.

**09:30-11:00 Session II (Room C-10th Floor):
Mechanism of Human Disease I**

Chair: Richard Grimes, Adjunct Professor, University of Texas Health Science Center at Houston, USA.

1. Peter Tompa, Professor, VIB Center for Structural Biology, Belgium, Steven Boeynaems, University of Leuven, Belgium, Elke Bogaert, University of Leuven, Belgium, Denes Kovacs, Vrije Universiteit Brussel (VUB), Belgium & Ludo Van Den Bosch, University of Leuven, Belgium. Structural Disorder Promotes Phase Separation of C9orf72 Dipeptide Repeats in ALS.
2. Noha Elghazally, Lecturer, Tanta University, Egypt. Evaluation of Nutritional Care Given to Patients with Chronic Diseases Admitted at Tanta University Hospitals.
3. Natallia Puzan, Researcher, Institute of Radiobiology of the National Academy of Sciences, Belarus & Ihar Cheshyk, Director, Institute of Radiobiology of the National Academy of Sciences, Belarus. State of the Extracellular Transport System (Albumin) in Women of Gomel Region of the Republic of Belarus.

**11:00-12:30 Session III (Room B-1st Floor):
Financing**

Chair: Paul Contoyannis, Head, Health Economics & Management Research Unit, ATINER & Associate Professor & Director of Graduate Studies, McMaster University, Canada.

1. Sergio Ivan Prada Rios, Professor, Universidad Icesi – Proesa, Colombia. Depression and Paid Sick Leave in Colombia: Evidence from a Health Insurer in a Universal Health Insurance Context.
2. Pawel Kawalec, Assistant Professor, Jagiellonian University Medical College, Poland. Assessment of Changes in Polish

**11:00-12:30 Session IV (Room C-10th Floor):
Diabetes**

Chair: Anthony Koutoulis, Head of School of Biological Sciences, University of Tasmania, Australia.

1. Richard Grimes, Adjunct Professor, University of Texas Health Science Center at Houston, USA & Deanna Grimes, Professor, University of Texas Health Science Center at Houston, USA. A Population based Approach to Quantifying the level of Control of Hypertension and Diabetes.
2. Baris Ozgur Donmez, Assistant Professor,

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| <p>Reimbursement Systems in Period 2012-2016.</p> <p>3. Nitya Saxena, Research Scholar, Indian Institute of Management Indore, India, Deepak Sethia, Professor, Indian Institute of Management Indore, India & Karthikeya Naraparaju, Professor, Indian Institute of Management Indore, India. Interstate Inequalities in Disease Burden and Health Expenditure: Evidence from Regional Health Accounts in India.</p> <p>4. <u>Hussam Albugami</u>, PhD Student, McMaster University, Canada and Teaching Assistant, King Abdulaziz University, Saudi Arabia, Julia Abelson, Professor, McMaster University, Canada, John Lavis, Canada Research Chair in Evidence-Informed Health Systems, McMaster University, Canada & Arthur Sweetman, Professor, McMaster University, Canada. Role of Institutions, Interests, and Ideas in Saudi Arabia's Decision to Adopt Private Financing and Delivery of Tertiary-Level Healthcare within Vision 2030.</p> <p>5. <u>Claire Jackson</u>, Director, Centres for Primary Care Reform Research Excellence and Professor, University of Queensland, Australia, <u>Caroline Nicholson</u>, Director, Centre for Integrated Care and Innovation, Mater Research Institute, University of Queensland, Australia, <u>William Glasson</u>, Adjunct Associate Professor, University of Queensland, Australia & <u>Nicola Glasson</u>, Medical Doctor, James Cook University, Australia. Moving Complex Care from the Hospital to the Community: What are the Policy Implications and Cost Impact?</p> | <p>Akdeniz University, Turkey. Nilay Kusu, Akdeniz University Faculty of Medicine Department of Histology and Embryology, Turkey. Nihal Ozturk, Akdeniz University Faculty of Medicine Department of Biophysics, Turkey. Semir Ozdemir, Akdeniz University Faculty of Medicine Department of Biophysics, Turkey. Nurettin Oguz, Akdeniz University Faculty of Medicine Department of Anatomy, Turkey. Ramazan Sari, Akdeniz University Faculty of Medicine Department of Internal Medicine, Antalya, Turkey, Ciler Celik Ozenci, Akdeniz University Faculty of Medicine Department of Histology and Embryology, Turkey. The Effect of Tungstate Treatment on Poly Polymerase Activity in Diabetic Rat Testis.</p> |
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| <p>12:30-14:00 Session V (Room B-1st Floor): Training and Safety</p> | <p>12:30-14:00 Session VI (Room C-10th Floor): Mechanism of Human Disease II</p> |
| <p>Chair: Pawel Kawalec, Assistant Professor, Jagiellonian University Medical College, Poland.</p> | <p>Chair: Peter Tompa, Professor, VIB Center for Structural Biology, Belgium.</p> |
| <p>1. <u>Saraswathi S.</u>, Assistant Professor, Bangalore Medical College and Research Institute, India & <u>Shobha</u>, Assistant Professor, Bangalore Medical College and Research Institute, India. Implementation of IEC Activities to Address Social Determinants of Health for Holistic Development of under Privileged Urban Areas, India.</p> <p>2. Dorothy Mary Johnston, Health Education Officer - Graduate, Multicultural Health Education Officer, Australia. Cultural Competence Training in Sydney Local Health District Australia.</p> <p>3. Rachel Boveja, PhD Student / Instructor, Indiana University, USA. Multicultural Health Diplomacy: A Model for Health Education and Healthcare Provider Training.</p> | <p>1. <u>Tolga Cavas</u>, Professor, Uludag University, Turkey, Huzeyfe Huriyet, MSc Student, Uludag University, Turkey, Ozgur Vatan, Associate Professor, Uludag University, Turkey & Nilufer Cinkilic, Professor, Uludag University, Turkey. Evaluation of the In Vitro Cytotoxic and Genotoxic Effects of Parabens (Butylparaben, Methylparaben and Propylparaben) in BEAS-2B Human Lung Epithelial Cell Line.</p> <p>2. SungChul Seo, Professor, Catholic University of Pusan, South Korea, Han-Jong Ko, Professor, Korea National Open University, South Korea & Dong Hyun Lee, Senior Researcher, Technology Institute of Environmental Health and Safety, South Korea. Spatiotemporal Patterns of Allergic Disease Prevalence in Korea: Looking beyond Aggregates.</p> <p>3. <u>Glenn Oyong</u>, Academic Service Faculty, De</p> |

La Salle University, Philippines, Maria Carmen Tan, Academic Service Faculty, De La Salle University, Philippines, Saeed Karami Ishghlo, Faculty of Engineering, Payam e Noor University of Bukan, Iran, Khristina Judan Cruz, Assistant Professor, Central Luzon State University, Philippines & Esperanza C. Cabrera, Professor, De La Salle University, Philippines. Preferential Regulation of *Akt*, *CD133*, *cfos* and *cjun* Genes Linked to Anti-Neoplastic Activity of *Gundelia tournefortii* L. on Malignant Melanoma Stem Cells.

14:00-15:00 Lunch

15:00-17:00 Session VII (Room B-1st Floor): Health and Lifestyle

Chair: Steven Jonas, Professor Emeritus, Stony Brook University, USA.

1. Julie Spencer-Rodgers, Associate Professor, California Polytechnic State University, USA. HIV/AIDS, Treatment Adherence, and Lifestyle: A Qualitative Study.
2. Jing Zhang, Associate Professor, Renmin University of China, China. Retirement and Health of the Elderly: Evidence from a Regression Discontinuity Design.
3. Laura Gray, Research Associate, University of Sheffield, UK, Monica Hernandez, Senior Research Fellow, University of Sheffield, UK, Michael P. Kelly, Senior Visiting Fellow, University of Cambridge, UK & Michael J. Campbell, Emeritus Professor, University of Sheffield, UK. Family Lifestyle Dynamics and Childhood Obesity: Evidence from the Millennium Cohort Study.
4. Changle Li, PhD Candidate, Chulalongkorn University, Thailand & Siripen Supakankunti, Director, Centre for Health Economics, Chulalongkorn University, Thailand. The Impact of Tobacco Consumption on Rural Household Expenditure and Self-rated Health among Rural Household Members in China.

17:00-19:00 Session VIII (Room D-10th Floor): A Symposium on the Future Developments and Prospects of Engineering and Science Education & Research in a Global World

Chair: Lampros A. Pyrgiotis, President, Greek Society of Regional Scientists, Greece.

1. **Abhijit Deshmukh**, James J. Solberg Head and Professor, School of Industrial Engineering, Purdue University, USA. Convergence of Knowledge.
2. **Anthony Koutoulis**, Professor & Head of School of Biological Sciences, University of Tasmania, Australia. The Future Developments and Prospects of Biology Education and Research in a Global World – a Tasmanian and Australian context.
3. **LuAnn Carpenter**, Director, Student Program Assessment and Administration, Industrial and Systems Engineering, Auburn University, USA. Issues and Trends in Engineering Education at Auburn University, Alabama, United States of America.
4. **David H. Sanders**, UNR Foundation Professor, Past-Chair UNR Faculty Senate, Department of Civil and Environmental Engineering, University of Nevada, Reno, USA. Is the Future for Higher Education bright in the United States?
5. **Ravi Mukkamala**, Professor, Old Dominion University, USA. The Future of Computer Science.

For details on the discussion please [click here](#).

21:00-23:00 The Pragmatic Symposium of the Conference as Organized in Ancient Athens with Dialogues, Food, Wine, Music and Dancing but fine tuned to Synchronous Ethics

Tuesday 20 June 2017

07:30-10:30 Session IX (Room D): An Educational Urban Walk in Modern and Ancient Athens

Chair: Gregory Katsas, Vice President of Academic Affairs, ATINER & Associate Professor, The American College of Greece-Deree College, Greece.

Group Discussion on Ancient and Modern Athens.
Visit to the Most Important Historical and Cultural Monuments of the City (be prepared to walk and talk as in the ancient peripatetic school of Aristotle)

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| 11:00-12:30 Session X (Room B-1st Floor): Special Topics | 11:00-12:30 Session XI (Room C-10th Floor): Biological Mechanisms |
| Chair: Margaret Brandeau, Professor, Stanford University, USA. | Chair: Tolga Cavas, Professor, Uludag University, Turkey. |
| <ol style="list-style-type: none"> 1. Gloria Anetor, Senior Lecturer, National Open University of Nigeria, Nigeria. Low Socioeconomic Status: A Susceptibility Determinant in Chemical Exposure and Toxicity. 2. Marjan Walli-Attaei, PhD Candidate, McMaster University, Canada, Jeremiah Hurley, Professor and Chair, Department of Economics, McMaster University, Canada & Emmanouil Mentzakis, Associate Professor, University of Southampton, UK. An Empirical Test of Inequality Aversion towards Income and Health. 3. Jae Bok Lee, Research Professor, Korea University, South Korea, Chulyoung Roh, Associate Professor, City University of New York, USA & Sangin Park, Professor, Seoul National University, South Korea. A Study of Providers Ownership and Medicaid Affecting Hospital Choice Decisions: Are Medicaid Weakening the Link between the Barrier Access and Socioeconomic Resources? | <ol style="list-style-type: none"> 1. <u>Semir Ozdemir</u>, Professor, Akdeniz University, Turkey & Nihal Ozturk, Assistant Professor, Akdeniz University, Turkey. Dietary Magnesium Supplementation Alters Relaxation Kinetics and Electrical Activity of Rat Ventricular Myocytes. 2. <u>Enis Hidisoglu</u>, Research Assistant, Akdeniz University, Turkey, Deniz Kantar Gok, Postdoctoral Researcher, Akdeniz University, Turkey, Alev Duygu Acun, Research Assistant, Akdeniz University, Turkey, Hakan Er, Research Assistant, Akdeniz University, Turkey & Piraye Yargicoglu, Professor, Akdeniz University, Turkey. Dose Dependent Effects of Amyloid Beta 1-42 on Auditory Evoked Potentials. 3. <u>Giulia Vendramini Ferreira</u>, Pontificia Universidade Católica de Campinas, Brazil, Otacilio Camargo Junior, Pontificia Universidade Católica de Campinas, Brazil, Gustavo Santos, Pontificia Universidade Católica de Campinas, Brazil, Guilherme Abreu, Pontificia Universidade Católica de Campinas, Brazil, Antonio Crhispm, Pontificia Universidade Católica de Campinas, Brazil & Stefano Gabriel, Pontificia Universidade Católica de Campinas, Brazil. Traumatic Arteriovenous Fistula of the Superficial Temporal Artery. |

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| 12:30-14:00 Session XII (Room B-1st Floor): Evaluation | 12:30-14:00 Session XIII (Room C-10th Floor): Respiratory Health |
| Chair: Sergio Ivan Prada Rios, Professor, Universidad Icesi – Proesa, Colombia. | Chair: Semir Ozdemir, Professor, Akdeniz University, Turkey. |
| <ol style="list-style-type: none"> 1. Margaret Brandeau, Professor, Stanford University, USA. Estimation of the Cost-Effectiveness of HIV Prevention Portfolios for People Who Inject Drugs in the United States: A Model-Based Analysis. 2. <u>Georgios Xydopoulos</u>, Research Associate, University of East Anglia, UK & Richard Fordham, Professor, University of East Anglia, UK. Cost-Effectiveness of Home Based Blood Pressure Monitoring Mobile App for Pregnant Women: A Feasibility Study in UK. 3. <u>Jennifer Bailey</u>, MSc Student, University of California, San Diego, USA & Tarik Benmarhnia, Professor, University of California, San Diego, USA. The Health Benefits of Reducing Particulate Matter | <ol style="list-style-type: none"> 1. <u>Joanna Reszczynska</u>, PhD Student, National Centre for Nuclear Research, Poland, Ludwik Dobrzyński, National Centre for Nuclear Research, Poland & Krzysztof W. Fornalski, PGE EJ, Poland. Collective Data Analysis of Correlation between Lung Cancer Incidences and Residential Radon Concentration. |

Emissions from Wood Burning in Athens,
Greece: A Health Impact Assessment.

14:00-15:00 Lunch

15:00-16:30 Session XIV (Room C-10th Floor): General Topics II

Chair: Leonas Valkunas, Professor, Vilnius University, Lithuania.

1. Taylor Robinson, Instructor, Gavilan College, USA. The Critical Importance of Human Cadaver Dissection in the Study of Human Anatomy for Pre-Medical and Pre-Nursing Undergraduate Students.
2. Marcelo Boareto, Post-doc, BSSE – ETH Zurich, Switzerland. Interplay between Notch Signaling and ID Factors during Adult and Embryonic Neurogenesis.

21:00- 22:30 Dinner

Wednesday 21 June 2017
Educational Island Tour or Mycenae and Epidaurus Visit

Thursday 22 June 2017
Delphi Visit

Hussam Albugami

PhD Student, McMaster University, Canada/Teaching Assistant, King
Abdulaziz University, Saudi Arabia

Julia Abelson

Professor, McMaster University, Canada

John Lavis

Research Chair, McMaster University, Canada

&

Arthur Sweetman

Professor, McMaster University, Canada

**The Role of Institutions, Interests, and Ideas in Saudi
Arabia's Decision to Adopt Private Financing and Delivery
of Tertiary-Level Healthcare within Vision 2030**

Context: The Kingdom of Saudi Arabia (KSA) is presently working toward the privatization of its health sector to minimize government costs and support the financing and delivery of medical services¹². This noble policy restructuring is a primary initiative undertaken by its Ministry of Health (MoH) in collaboration with other stakeholders in the healthcare sector. The present policy analysis addresses the following research question: "What is the role of institutions, interest, and ideas in shaping KSA's decision to adopt the private financing and delivery of tertiary-level healthcare within Saudi Vision 2030?" Further, this study comprehensively discusses the limitations of the initiation and implementation of the health policy in KSA's health sector.

Methods: The study applies the 3i framework to understand how relevant stakeholders collaborate to effectively adopt the private financing and delivery of tertiary-level healthcare with the national blueprint of Saudi Vision 2030.

Findings: The results indicate that institutions, interest, and ideas play a critical role in shaping KSA's approach to the two concepts. The knowledge base on the issue combined with views held by different groups—e.g., researchers, policy entrepreneurs, and consultative council—have defined the path for policy development. Importantly, the policy is largely based on the values held by the government and decision makers in the MoH, which are to deliver quality healthcare to citizens and reduce government expenditure on healthcare.

Conclusions: The success of implementing the program largely relies on coordination, transparency, and support from all stakeholders. Thus, a holistic approach to the process is essential to ensure long-term sustainability. Finally, the government's primary aim to achieve cost

effectiveness, that is, to reduce healthcare expenditure, plays a key role in the adoption and development of the healthcare privatization policy.

Gloria Anetor

Senior Lecturer, National Open University of Nigeria, Nigeria

Low Socioeconomic Status: A Susceptibility Determinant in Chemical Exposure and Toxicity

Socioeconomic status has been explored in a number of diseases in the past. Low socioeconomic status or class (LSS; LSC) was considered protective against the major non-communicable diseases such as cardiovascular disease and cancer. It was in contrast highly regarded to be a greater susceptibility factor to infectious diseases that are very prevalent in the resource poor countries. But LSC has largely been ignored in chemical exposure and toxicity which are on the increase in these countries owing to progressive industrialization. In light of the current spate of industrialization with increasing chemical utilization and chemical waste generation it appears desirable to examine the contribution of low socioeconomic class to increased chemical exposure and toxicity. It is noteworthy that the resource poor countries have the poorest regulatory policies and monitoring procedures of chemicals. Low socioeconomic class is often associated with poverty with attendant low nutritional status; including micronutrient deficiency disorders (MDDs) and reduced antioxidant status.

This implies greater free radical burden implicated in many pathological processes including chemical toxicity. Optimum nutritional status may modify or mitigate chemical toxicity through the antioxidant hypothesis. Increased susceptibility factors are associated with a raised disease burden or risk. Nutritional status may therefore modify susceptibility to chemical toxicity in LSC associated with nutritional deficiency states that may other-wise enhance vulnerability. Lead poisoning, a well know toxicant occurs most frequently in disadvantaged populations; lead and iron share a common transporter, the divalent metal transporter. Iron deficiency one of the commonest nutritional deficiencies is reported to enhance lead absorption and toxicity. Women and children are particularly vulnerable. Indeed, cognitive disorders caused by the co-existent of both nutritional deficiency and increased chemical exposure (double burden) has been described as a silent pandemic. Sub-optimal nutritional status from LSC may lead to reduced optimal health and development. Low socioeconomic status potentiates even relatively small risk factors, causing more marked contribution to disease when a huge population is involved. Most toxicants from the environment are cumulative and

could lead to high cost of health care and well-being in low socioeconomic individuals and communities.

It therefore seems rational for future investigations to examine low socioeconomic status in chemical exposure and toxicity as a possible useful approach to pragmatically address the growing problem of chemical exposure and toxicity in industrializing developing countries.

Jennifer Bailey

MSc Student, University of California San Diego, USA

&

Tarik Benmarhnia

Professor, University of California San Diego, USA

The Health Benefits of Reducing Particulate Matter Emissions from Wood Burning in Athens, Greece: A Health Impact Assessment

Introduction: Athens, Greece is experiencing urban population pressure enhanced by refugees and is in the midst of an economic crisis, which has led to an increase in wood burning as a less expensive method of residential heating. Wood combustion results in particulate matter (PM) pollution that degrades air quality and has negative impacts to human health. The objective is to conduct a health impact assessment (HIA) quantifying the benefits to human health due to intervention strategies to reduce PM pollution from wood burning activities.

Methods: We performed a systematic review to identify studies that measured the health benefits and effectiveness of interventions established to improve the technology of wood burning stoves, thereby reducing PM_{2.5} and PM₁₀ emissions. We conducted a random effect meta-analysis to obtain pooled estimates of PM reductions associated with different strategies to obtain different scenarios. Using varying scenarios, and data retrieved from Athens and related peer-reviewed studies, we calculated population attributable fractions to estimate the number of preventable premature deaths and respiratory health outcomes in regards to different strategies. We also estimated the economic impacts and determined the return on investment (ROI) from these different scenarios.

Results: The results will include the estimation of improved health associated with the intervention and its economic viability, attempting to lay a basis for the possibility of the strategy to be put in place in Athens.

Conclusions: It is expected that an intervention policy bettering the technology of wood burning stoves can be systematically applied to Athens through a HIA quantifying the reduction in PM and the associated health improvements, which can be used by local policy-makers to put effective strategies in place.

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Interplay between Notch Signaling and ID Factors during Adult and Embryonic Neurogenesis

During neurogenesis, multipotent neural stem cells (NSCs) give rise to the correct number and types of neurons. Notch signaling and inhibitor of DNA binding (ID) factors are recognized as pivotal during neurogenesis, however it has been difficult to evaluate experimentally the underlying mechanism of their interactions and the differences between embryonic and adult neurogenesis. Here, we combined mathematical modeling with single-cell transcriptomics to elucidate key interactions between the Notch and ID pathways in embryonic and adult NSCs. We show how both pathways regulate neurogenesis in a complementary and independent manner in the adult brain. In contrast, during brain development, Notch signaling directly regulates the expression of IDs and this regulation together with the presence of high levels of E proteins precludes ID-induced quiescence. Our analyses unveil key molecular interactions underlying NSC quiescence, maintenance and differentiation, highlighting mechanistic differences between embryonic and adult NSCs. Similar mechanisms are expected to be critical in other stem cell systems during development and disease.

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Multicultural Health Diplomacy: A Model for Health Education and Healthcare Provider Training

Diplomacy is an essential skill for international relations and foreign affairs. However, this skillset can be valuable for other global initiatives, such as public health. In many countries, healthcare has been affected by migration and has impacted individuals from various cultural backgrounds. As perceptions of health vary among cultural groups, so do the health services needed to accommodate those groups. Some healthcare challenges include limitations in communication and cultural literacy. Therefore, it is imperative to review the tools being used to accommodate these global health movements.

Multicultural Health Diplomacy is a concept involving a set of skills suitable for engaging in cultural health literacy. Fundamental to health education and healthcare services, these skills can serve as a model to create a healthcare system which supports the diversity and well-being of all individuals. *Multicultural Health Diplomacy* is inspired from *Global Health Diplomacy*, which has its foundation in foreign policy. Therefore, using these skills at the community level can also serve as a conduit for bridging ground level healthcare to foreign policy.

In this paper, the current status of global migration is highlighted to express the need for cultural competency training for health educators and healthcare providers at institutional, organizational, community, and individual levels. In particular, this paper focuses on the use of diplomacy skills in cultural health competency training to aid in the interaction and ongoing relationships between health care professionals and the diversity of individuals receiving healthcare services.

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Estimation of the Cost-Effectiveness of HIV Prevention Portfolios for People Who Inject Drugs in the United States: A Model-Based Analysis

The US drug injecting population is growing, with increasing deaths from opioid overdose as well as increased HIV transmission. Cost-effective prevention programs for people who inject drugs (PWID) are essential to the long-term health outcomes for this population and other high-risk groups in the US. To identify high-value HIV prevention program portfolios for US PWID, we considered combinations of four interventions with demonstrated efficacy: opioid agonist therapy (OAT), needle-syringe exchange programs (NSP), screening and intensive antiretroviral therapy programs (Test & Treat), and oral HIV pre-exposure prophylaxis (PrEP). We adapted an empirically calibrated dynamic compartmental model and used it to assess the costs and health outcomes of the four interventions, considered singly and in combination over a 20-year time horizon.

We estimate that expansions of OAT, NSP, and Test & Treat implemented singly up to 50% coverage levels can be cost-effective relative to the next highest coverage level (low, medium, and high at 40%, 45%, and 50%, respectively) and that OAT, which generates immediate and direct health benefits to the individual, has the potential to be the highest value investment, even under scenarios where it prevents fewer infections than other programs. When coverage expansions are allowed to include combined investment with other programs and are compared to the next best intervention, the model projects that scaling OAT coverage, then scaling NSP coverage, then scaling Test & Treat coverage can be cost-effective, with each coverage expansion having the potential to cost less than \$50,000 per quality-adjusted life year gained relative to the next best portfolio. In probabilistic sensitivity analyses, 59% of portfolios prioritize the addition of OAT and 41% prioritize the addition of NSP, while PrEP was not likely to be a priority nor a cost-effective addition.

We conclude that programs of OAT, NSP, and Test & Treat, implemented singly or in combination, have the potential to effectively and cost-effectively prevent HIV in US PWID. PrEP is not likely to be cost-effective in this population. While local budgets or policy may constrain feasible coverage levels for the various interventions, our findings suggest that investments in combined prevention programs

can substantially reduce HIV transmission and improve health outcomes among PWID.

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Evaluation of the In-Vitro Cytotoxic and Genotoxic Effects of Parabens (Butylparaben, Methylparaben, and Propylparaben) in BEAS-2B Human Lung Epithelial Cell Line

In the present study, the in vitro cytotoxic and genotoxic effects of three parabens (butylparaben, methylparaben and propylparaben) have been evaluated in BEAS-2B human bronchial epithelial cell line. Cytotoxicity assays were carried out using the XTT test whereas the comet assay was used as genotoxicity endpoint. The intracellular reactive oxygen species (ROS) levels were also measured following paraben exposure to assess possible toxicity mechanism. XTT test revealed significant decreases in the viability of BEAS-2B treated with three parabens with the IC₅₀ values of 2.90, 3.13 and 2.68 mM for butylparaben, methylparaben and propylparaben, respectively. Genotoxicity analyses showed that, all three parabens are capable of induce DNA strand breaks as demonstrated with significant increases in comet assay parameters such as tail length, tail moment and tail % DNA. We also detected significantly increased reactive oxygen species (ROS) in BEAS-2B cells treated with all three parabens. In conclusion, our findings provide evidence that butylparaben, methylparaben and propylparaben exposure may cause cytotoxic and genotoxic effects in human cells via ROS induction.

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**The Effect of Tungstate Treatment on Poly Polymerase
Activity in Diabetic Rat Testis**

Diabetes mellitus has adverse effects on male sexual and reproductive functions in diabetic patients and animals, but the exact mechanism of diabetes mellitus causing testicular damage and dysfunction has not been clearly defined. The aim of the present study was to investigate the preventive and therapeutic potential of tungstate on testicular damage in STZ-induced diabetic rat model and to elicit whether tungstate has anti-apoptotic effects. STZ-induced diabetic rats exhibited increase in plasma glucose concentration and decrease in body weight gain. Plasma glucose levels were significantly but partially improved by sodium tungstate administration in diabetic rats with respect to initial values. We showed first time that PARP activity increased in STZ-induced diabetes and testicular dysfunction. Furthermore, the results of this study also suggested that sodium tungstate, in addition to anti-diabetic effects, possesses decreased PARP activity. Sodium tungstate can either increase antioxidant defense mechanisms or reduce the oxidative stress, probably due to reduction in plasma glucose level and in consequence alleviation of protein glycation or induction of gene expression of some antioxidant enzymes. In conclusion, sodium tungstate could be a potential treatment for diabetes and its complications in testis.

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Evaluation of Nutritional Care Given to Patients with Chronic Diseases Admitted at Tanta University Hospitals

Good nutrition is essential for the improvement of the patient health. Providing care for the sick is the primary purpose for which the hospital exists. All aspects of the hospital operation must be developed with the focus centered on the patient and his needs. This study was conducted to evaluate the nutritional care given to patients with chronic diseases admitted at Tanta University Hospitals, in Tanta city, Gharbia Governorate, Egypt. Non probability purposive sample technique was used to include three hundreds hospitalized adult patients above twenty years old suffering from diabetes mellitus, chronic obstructive pulmonary disease and hepatitis diseases admitted at Internal Medicine, Chest and Tropical Medicine Departments at Tanta University Hospital for a period of one year. The studied cases were interviewed to fill a specially designed questionnaire sheet included the following items: patient's history and sociodemographic data, assessment of the nutritional status of patients, patient satisfaction, assessment of nutritional services conducted by Tanta University Hospital. Comparing nutritional status of patients at admission and at leaving the hospital; a decrease in BMI during the period of hospitalization and the food intake of patients was affected during the period of hospitalization. The majority of patients were satisfied by the food given from the hospital kitchen. The applied food safety measures were poor in both university kitchens. It was evident that nutritional status of patients were affected during the period of hospitalization, so emphasis on improving the nutritional care of hospitals and application of food safety measures in hospital kitchens.

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Traumatic Arteriovenous Fistula of the Superficial Temporal Artery

Arteriovenous fistulae of the scalp are direct connections between the arterial feeding vessels of the scalp and the draining veins without an intervening capillary bed. The draining veins are often grossly enlarged and tortuous, resembling a varix. Most of these fistulae occur as a result of an incidental injury or iatrogenic injury. Arteriovenous fistula of the scalp is relatively rare. The superficial temporal artery is particularly vulnerable to trauma due to its long and relatively exposed course in the scalp.

We report the case of a 44-year-old man who presented a traumatic arteriovenous fistula of the superficial temporal artery, five years after a motorcycle accident, treated by complete surgical excision and review the literature with regard to etiology, clinical manifestations, pathogenesis, diagnosis and management of these unusual lesions.

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Family Lifestyle Dynamics and Childhood Obesity: Evidence from the Millennium Cohort Study

Using data from the Millennium Cohort Study, we investigate the dynamic relationship between underlying family lifestyle and childhood obesity during early childhood. We use a dynamic latent factor model, an approach that allows us to identify family lifestyle without measurement error, its evolution over time and its influence on childhood obesity and other observable outcomes. We find that family lifestyle is persistent and has a significant influence on childhood weight status as well as other outcomes for all family members. Interventions should therefore be prolonged and persuasive and target the underlying lifestyle of a family as early as possible during childhood in order to have the greatest cumulative influence. Furthermore, the results indicate that to reduce inequalities in childhood obesity, policy makers should target disadvantaged families and design interventions specifically for these families.

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A Population Based Approach to Quantifying the Level of Control of Hypertension and Diabetes

Background. Public health agencies usually evaluate success in controlling diabetes and hypertension by determining what percent of treated individuals reach target goals. A population based approach to control of these conditions should examine whether the entire population of persons with these conditions (in treatment or not) have controlled their disease. This requires examination of clinician and patient adherence to screening recommendations and whether successfully screened patients are properly treated for their condition and whether they adhere to treatments.

Methods. Literature searches identified prevalence of hypertension, hypertensives diagnosed, hypertensives being treated and percent controlled (<140/90) in Canada, France, Germany, Greece, Portugal, Spain, United Kingdom and United States. We used studies that: 1) were conducted on representative samples of a country's population, 2) estimated the percent of a population with hypertension (systolic >140/diastolic >90 or took antihypertensive medications), 3) published since 2010, 4) reported percents of diagnosed hypertensives receiving treatment and 5) reported percent of treated person with blood pressure <140/90. Data from the International Diabetes Foundation were used to identify prevalence of type 2 diabetes, percent of diabetics diagnosed and persons with controlled diabetes (Hb1AC <7.0%) in Canada, France, Germany, Greece, Italy, Spain, United Kingdom, and United States. The number of persons being treated for diabetes for each country was derived from literature published since 2010.

Results. The percent of a country's hypertensives that had BPs below 140/90 by country: Canada (45.5%), France (45.7%), Germany (30.3%), Greece (37.9%), Portugal (24.4%), Spain (14.7%), UK (9.3%) and USA (36.1%). The percent of a country's diabetics who had Hb1AC <7.0% were Canada (34.0%), France (34.3%), Germany (19.4%), Greece (17.0%), Italy 19.9%), Spain (31.8%), UK (12.6%) and USA (36.4%).

Conclusion. Failure to screen, failure to diagnose, failure to treat and failure to adhere to medications are all important to control hypertension and diabetes in populations.

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Dose Dependent Effects of Amyloid Beta 1-42 on Auditory Evoked Potentials

Amyloid beta ($A\beta$) is the principal component of the amyloid plaques and initiate pathological processes in the cortex, hippocampus, and several other structures of the brain in the Alzheimer's disease (AD). Therefore, we aimed to identify how brain electrical activity change by $A\beta$ injection and whether the observed changes can be used as a new biomarker for early diagnosis of the AD.

In our present study, 64 Wistar rats were divided randomly into eight experimental groups: Control group (C) and seven AD model groups obtained by intracerebroventricular $A\beta_{42}$ injection in increasing concentrations. In all rats, anesthesia was provided with mixture of Ketamine-based anesthetics (Ketamine, 50 mg/kg and Xylazine, 10 mg/kg; intraperitoneally, i.p.). Under the anesthesia, either $A\beta_{42}$ peptide or saline (0.9% NaCl) was injected into both lateral ventricles in 1 μ l/minute rate by using Hamilton microsyringe. Following this process, recording electrodes were placed bilaterally into the frontal, parietal, temporal and occipital cortex while the reference electrode was placed into cerebellum. Then, auditory evoked potentials (AEPs) were recorded by using multi-electrodes in awake, freely moving rats, and were analyzed mathematically to determine the changes related to accumulation of $A\beta$.

There was no difference in the latency values of AEPs among groups, but injection of $A\beta_{42}$ significantly affected peak to peak amplitudes of AEPs. It was also found that there were significant differences among the auditory evoked gamma responses between groups.

These results demonstrated that $A\beta$ administration induces significant changes in brain activity and the observed changes in the

gamma responses could be used to determine the localization of the A β in the brain.

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**Moving Complex Care from the Hospital to the
Community: What are the Policy Implications and Cost
Impacts?**

The benefits of transferring chronic complex care from hospital to the more-accessible community setting has been gaining international momentum for some time (1,2). Our team has published internationally on the topic - developing and evaluating an integrated, wholistic 'beacon' community diabetes model (3,4) ; as well as a community outreach model for diabetic retinopathy screening (5,6). Both models have demonstrated superior clinical outcomes to traditional hospital-based care, with high provider and patient satisfaction. Both models use a *co-creation* methodology, emphasizing ongoing, collaborative value creation between researchers and end users - academics, clinicians, policy makers, and service organisations (7).

A prospective controlled trial of the 'beacon' showed that patients receiving care via the 'beacon' community model, compared with usual care at a hospital-based outpatient department (OPD), had significantly improved HbA1c concentrations, blood pressure and total cholesterol (3). Patients also valued the accessibility and supportive interpersonal care provided by the multidisciplinary integrated care team.(8) 'Beacon' care was much less costly than care delivered via the hospital OPD , and 'beacon' patients were only half as likely to be hospitalised with a potentially preventable diabetes-related diagnosis than their usual care counterparts (4).

The rural outreach Diabetic Retinopathy screening model boosted guideline-appropriate retinopathy screening in remote Australia from 16% to 66% of the eligible population (6).

This panel session will briefly describe both models, and present new work on costings, as well as benefits to the patient, provider and health system overall, before raising the policy implications related to the shift in care setting.

The session will involve 3 parts:

- Presentation of each model with appropriate evaluation of care quality, patient and provider satisfaction, and cost savings.
- Identification of the potential policy implications from both an Australian and an international perspective.
- Involvement of panel participants and the audience in discussing the policy, cost and operational implications of the international trend to community-based settings for complex chronic care.

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**Cultural Competence Training in Sydney Local Health
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Generally the health of immigrants in Australia is better than the health of Australian born people. Over time, however the immigrants lose this health advantage. (Health statistics New South Wales (NSW) 2013) This is due to a few factors including not knowing the health system and the language barrier.

20% of the NSW population speak a language other than English at home and in Sydney Local Health District (SLHD) 43% of the population speak a language other than English at home.

To promote equity in health care by the provision and advocacy for accessible, fair, culturally sensitive and appropriate health services, provision of information in community languages and use of professional interpreters where appropriate, as well as making changes to accommodate diversity SLHD health workers also need the skills to be able to work effectively with culturally diverse clients and colleagues. These skills are developed by the provision of Cultural Competence training.

The Multicultural Policy of the NSW Government is the Principles of Multiculturalism Act 2000. The Framework specifies that public contact staff, policy and management positions are to enhance their skills in "cultural competence" through cultural competence training and that staff in multicultural positions are supported to develop skills and career pathways.

Cultural Competency training includes the education of health workers about government policy, the demographics of the health district, training in cross cultural communication skills and the development of an understanding of the impact of culture and benefits of diversity.

NSW Health is a registered training authority. The accredited course "Work with Diverse people" is the core component in the training for Diploma of Nurses and Certificate 3 in Health Administration. Health workers who complete this course develop cultural competency skills and receive a recognised qualification.

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Ending the “Drug War,” Solving the Drug Problem: The Public Health Approach

“Ending the Drug War.” That has been a rallying cry for drug policy reformers almost since the “Drug War,” aimed primarily at the trade in and use of marijuana, heroin, and cocaine, was first declared in the U.S. by President Richard M. Nixon, in 1971. A basic premise of the “Drug War” is that there is a dichotomy among what can be called the “Recreational Mood Altering Drugs,” the RMADs. But the “Drug War” is not a war on general RMAD use. Rather it is rather a very limited war, on certain users of certain RMADs, the entirely artificially defined “illicits” (see above). However, the “licits” --- primarily alcoholic beverages and tobacco products --- are orders of magnitude more widely used and more harmful to the health of any nation than the illicits.

Unfortunately, the drug policy reform (DPRM) around the world for many years has a) bought into the “Drug War’s” artificial dichotomy, and in certain countries like the United States of America, b) has become more-and-more focused on marijuana legalization rather than dealing with the negative health effects of all RMAD-use, best approached using legal/public health measures. Of course, for the U.S. the DPRM *critique* of the “Drug War” is right on track. It: a) has been totally ineffective in achieving its publicly stated objectives, b) has a racist basis that has become ever more apparent over the years, c) is enormously costly, d) has led directly to the problem of massive incarceration of minority young men, and e) like the original Prohibition in the U.S., has created a large, very profitable, criminal enterprise which would otherwise not exist.

As a public health physician for many years I have worked on dealing with the negative health outcomes of the use of the illicits, but also with the much more widespread negative health effects of the use of the licits, and the social, political, and economic inter-relationships between the two groups. And so, over the years I developed what I call the Public Health Approach to the Drug Problem (PHADP). It is based on five important principles:

- 1) The drug problem is a unity not a duality;
- 2) The United States has a broad-based Drug Culture, which promotes not only the use of the “licit” RMADs themselves (as well as, by both government and private interests, gambling,

potentially a highly addictive behavior). It also heavily promotes the use of both pharmaceutical and over-the-counter drugs as problem-solvers --- “have a problem? Take this pill” --- when such use is not always indicated and can easily become excessive.

- 3) RMAD-use, part of human culture apparently since there has been human culture, will never be eliminated, nor should any attempt be made to do that; rather the focus should be on reducing the negative health effects of their use, to the extent possible, using tried-and-true public health methods which have been shown to work;
- 4) that there is a series of major Stakeholders in the maintenance of the “Drug War,” which range, among others, from certain political interests to the drug cartels themselves;
- 5) Along with its many negatives the “Drug War” actually interferes with solving the drug problem.

Fortunately, there is an outstanding example of how the PHADP can be very successful, over time --- in dealing with cigarette smoking. It has been introduced in many countries around the world. In the U.S. it is of course, the United States’ Public Health Service’s National Anti-Smoking Campaign which, since 1964, has reduced the adult smoking rate from 45% to 18%. And guess what? It did so without locking up even one cigarette smoker.

The PHADP has approximately 20 separate elements, ranging from the development of a rational classification system for the RMADs, through the development of a regulated sale model, to the development of a rational RMAD-use control educational and advertising campaign. At the conference, available time would control the amount of detail that would be covered. Attendees would be referred to my book on the subject: https://www.amazon.com/Ending-Drug-War-Solving-Problem-ebook/dp/B01EO9RGKO/ref=sr_1_4?s=books&ie=UTF8&qid=1461783388&sr=1-4&keywords=Ending+the+Drug+War.

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Assessment of Changes in Polish Reimbursement Systems in Period 2012-2016

Objective: The aim of the study was to assess the influence of public advisory bodies (the Transparency Council, the President of the AOTMiT; The Polish Agency for Health Technology Assessment and Tariff System) involved in the process on final reimbursement decisions performed by the Ministry of Health.

Methods: We have analysed all statements of the Transparency Council as well as the President of the AOTMiT recommendations and final reimbursement decisions in Poland for the period of three years – from 2014 to 2016. For each recommendation we collected data on decisions as well as potential additional requirements regarding the reimbursement; data was presented for the whole analyzed period and separately for each year, to assess the general tendencies in the reimbursement decision-making in Poland. We collected all data accessible at November 2016. The tau Kendall measurement of agreement was used to assess the compliance between statements, recommendations and reimbursement decisions.

Results: We collected 245 records, including 241 Transparency Board statements and 243 recommendations by the President of the AOTMiT, of which 65% and 64%, respectively, were positive. In 86% of the cases, the President of the AOTMiT was compliant with the statements of the Transparency Board (good agreement with coefficient of 0.6998). In case of all analysed drugs, 40% have already gained a positive reimbursement decision. Agreement between the recommendations and reimbursement statuses was 0.2529, which represents only fair agreement; it occurred that 24% of drugs with a negative recommendation obtained positive final reimbursement decision.

Conclusions: We observed that final reimbursement decisions did not reflect statements and recommendations issued by the advisory boards. Positive recommendations issued by the AOTMiT did not guarantee positive reimbursement status, and negative recommendations in some cases did not result in the lack of reimbursement.

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**A Study of Providers' Ownership and Medicaid Affecting
Hospital Choice Decisions: Is Medicaid Weakening the
Link between Barrier Access and Socioeconomic
Resources?**

In a public health care sector, private non-profit, for-profit and public hospitals provide publicly subsidized services to needy patients. Therefore, vulnerable and underserved patients play a role in purchasing the services. However, to assure enhancing competition and access to high quality services, it is possible that beneficiaries are able to make right decision. Many articles point out bypass behaviour of patients in health service markets and suggest their decision might be distorted. This article examines that whether patient choice decisions of hospitals are dependent on different types of ownership of hospitals such as profit and non-profit organizations and the competition among them. Using inpatients data from SPARCS, Bureau of Health Informatics Office of Quality and Patient Safety, and provider data from AHA, American Hospital Association from 2003 to 2009 in New York State, this analysis aims to explore how the ownership of providers, and competition between non-profit and for-profit contribute to alleviate bypass behaviours of inpatients. This topic is a timely issue in the sense that it provides insight into not only public health care delivery system and but also market-based solution using the competition between the non-profit and for-profit organizations.

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The Impact of Tobacco Consumption on Rural Household Expenditure and Self-Rated Health among Rural Household Members in China

Objectives: To estimate how tobacco consumption affects household expenditure on other goods and services in rural China and to assess the tobacco consumption affects self-rated health among rural household members in China.

Methods: Based on Quadratic Almost Ideal Demand System (QUAIDS), the Seemingly Unrelated Regression was used to assess the impact of tobacco consumption on rural household spending on other goods and services. The random effects generalized ordered probit model was used to detect tobacco consumption causing heterogeneity in self-rated health among adults in rural China. The nationally representative, longitudinal survey (2010-2014 China Family Panel Studies) was used for the analysis. The data set included 3611 households and 10610 adults in each wave.

Results: Tobacco consumption crowds out rural household expenditure on food (1.95%), healthcare (1.44%-3.47%), dress (0.57%) and education (2.20%) in China. Moreover, self-rated health gives a significantly positive coefficient with respect to never smoker and ex-smoker, that is, when the individual is never smoker or ex-smoker, he/she will be more likely to report his/her health status as positive.

Conclusions: The first analysis showed that tobacco consumption crowds out expenditures on food, dress, healthcare, and education for rural households in China, and the second analysis indicated that never smokers and ex-smokers are more likely to report their health status as better compared with last year. This study informs Chinese policymakers that tobacco control can improve not only rural household welfare but also rural household members' health status. Therefore, the Tobacco tax policy and Brief clinical interventions by doctor should be implemented in rural China.

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Preferential Regulation of Akt CD133, *cfos* and *cjun* Genes Linked to Anti-Neoplastic Activity of *Gundelia tournefortii* L. on Malignant Melanoma Stem Cells

Introduction and Objectives: The discovery of cancer stem cells (CSCs), which drive the relentless neoplastic development and growth within tumors, has clarified the obscurity of recurrent cancers unresponsive to consequent chemotherapies. Evasion of conventional therapies was later linked to the CD133+ phenotype in CSCs. Since CSCs are resistant to many current radiation- and chemo-related treatments, there is a rising trend in the discovery of bioactive compounds with chemotherapeutic potential from traditional medicinal plants. This study investigated the anti-proliferative activity of *Gundelia tournefortii* L., an ancient and traditional herb, against the multi-drug resistant CD133+ CSC subpopulation of malignant melanoma. Effects on the expression of *Akt*, *CD133* marker and pro-apoptotic *cfos* and *cjun* genes were also investigated.

Materials and Methods: *G. tournefortii* was obtained from West Azerbaijan and confirmed taxonomically by phenotypic and molecular methods. Working extracts from *G. tournefortii* were prepared by dichloromethane (DCM) extraction, rotavap drying and resuspension using 0.2% dimethylsulfoxide. CD133+ CSCs from WM-115 human melanoma were purified by flow cytometry and automated antibody-labeled cell sorting. Cell viability assays were performed using standard procedures employing PrestoBlue®. Gene expression studies involving specific primers for *Akt2*, *CD133*, *cfos* and *cjun* were accomplished via qRT-PCR. Gas chromatography tandem-mass spectrometry (GC-MS) was employed to determine the phytochemical composition of *G. tournefortii* extract.

Results: Purified CD133+ WM-115 human melanoma CSCs were examined for susceptibility to 5-fluorouracil (5FU) and doxorubicin (DOX) and were found to survive treatment towards increased proportions compared to CD133- WM-115. IC₅₀ values were >100 µg/mL (5-FU and DOX) in CD133+ WM-115 and 6.2 µg/mL (5-FU) and 5.1 µg/mL (DOX) in CD133- WM-115, respectively. Absolute quantitation of expressed *Akt2* transcripts by qRT-PCR was significantly upregulated in CD133+ compared to CD133- cells (P < 0.05). Expressed *cfos* and *cjun* transcripts were significantly downregulated in CD133+ cells compared to CD133- cells (P < 0.05). However, addition of Akt inhibitor benzimidazole IV in CD+133 cells significantly increased sensitivity to 5-FU and DOX suggesting an Akt survival pathway-dependent chemoresistance. Anti-proliferative investigation of *G. tournefortii* DCM extract showed high toxicity in 5FU-resistant (IC₅₀ = 8.45 µg/mL) and DOX-resistant (IC₅₀ = 7.15 µg/mL) CD133+ cells and CD133- cells (IC₅₀ = 6.97 µg/mL). Moreover, *Akt2* transcripts were significantly downregulated in both extract-treated CD133+ and CD133- cells compared to untreated controls (P < 0.05) while *cfos* and *cjun* transcripts were significantly upregulated compared to controls (P < 0.05). Surprisingly, plant extract treatment also resulted to significant decrease of expressed *CD133* in the CD133+ subpopulation compared to untreated control (P < 0.05). Chemical investigation of the plant extract by GC-MS afforded mevalonolactone and ester derivatives of palmitic, oleic, linoleic, stearic and heptadecanoic acids.

Conclusions: Results suggest that *G. tournefortii* preferentially induced early apoptosis by upregulating *cfos* and *cjun* expression, downregulated *Akt* expression and abolished the Akt-dependent survival of multi-drug resistant CD133+ WM-115 melanoma CSCs. Identified phytochemicals may target the Akt pathway suggesting that *G. tournefortii* may be a source of chemotherapeutic compounds.

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Dietary Magnesium Supplementation Alters Relaxation Kinetics and Electrical Activity of Rat Ventricular Myocytes

Magnesium is an essential mineral that plays a critical role in some metabolic functions in the body. However, the relationship between Mg^{2+} and excitation-contraction coupling in cardiac myocytes has not been clearly elucidated. Therefore, we investigated whether Mg^{2+} supplementation has impact on electrical and mechanical functions of cardiac myocytes.

Eight-week old male rats were randomly separated into two groups as control (C) group and magnesium oxide administered (MgO) group. The group treated with chronic MgO was fed with rat chow containing MgO (1 g/kg) for 6 weeks. Cardiac hypertrophy parameters such as heart weight, heart weight/tibia length ratio and cell capacitance was not different between groups. Intracellular free Mg^{2+} levels measured in Mag-fura2 loaded ventricular myocytes didn't change significantly in MgO-treated group. Although the fractional shortening didn't change in MgO administered group myocytes, significant slowing in contraction kinetics was measured. The amplitude of Ca^{2+} transients and rate of removal were also similar between groups. In the MgO-administered rats, the time to 50% of repolarization of action potential (AP) was significantly longer compared to control myocytes. Accordingly, repolarizing potassium currents were examined and transient outward potassium current (I_{to}) was significantly suppressed in MgO group myocytes while sustained potassium current (I_{ss}) wasn't affected. Furthermore, neither L-type Ca^{2+} currents and NCX activity nor SR Ca^{2+} content of ventricular myocytes was influenced by MgO administration.

In summary, Mg^{2+} rich diet suppresses I_{to} , causes prolongation in AP duration and results in slower relaxation, although it doesn't change Ca^{2+} regulation. Despite the prominent role of Ca^{2+} for contractile activity of ventricular myocytes, Mg^{2+} ion can also affect the dynamics of contractile function due to regulation of myofilament proteins. These results imply that even small changes in intracellular or extracellular Mg^{2+} concentration may exert significant effects on the functions of contractile proteins, independent of Ca^{2+} modulation.

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Recoveries to the General System of Social Security in Health in Colombia

The research focused on recoveries in drugs for a period of six years (2006 to 2012), identifying the drugs that had a higher recovery in the Obligatory Health Plan - POS and that not included in the POS.

Method: According to the database of the Solidarity Fund and guarantees in health - Fosyga were identified and classified the medicines through the agreements of the Health Regulatory Commission - CRES achieving differentiation of POS and non-POS drugs, additionally was identified for Each year the health care provider (EPS) through which the recoveries were processed in a greater proportion, finally, the difference between the recoveries demanded by the EPS and those approved by the Fosyga was identified.

Results and discussion: The recovery of medicines due to their lack of regulation presents cost overruns, in addition to recovering medicines that should not be recovered because they are within the obligatory health plan, which results in an even greater overcharge, an inefficient system and lack of sources.

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**Depression and Paid Sick Leave in Colombia:
Evidence from a Health Insurer in a Universal Health
Insurance Context**

The most prevalent mental health disorders in Colombia are anxiety and mood disorders. However the effects of these disorders on labor market outcomes are unknown in the country. The objective of this study was to estimate whether people suffering of these mental health disorders have more paid sick leave days measured as total paid sick leave days in one year and recurrence of paid sick leave events in one year than those without such diagnosis. The study used claims data from 2011-2014 of a health insurer with enrollees of all ages and living in multiple regions of the country. We used a two part model (TPM) to estimate the causal effect of any mental illness, anxiety disorders and mood disorders separately on paid sick days; and a recursive bivariate probit model to estimate the effect on recurrence of paid sick episodes, controlling for observed variables and for time invariant unobservables. We found that individuals diagnosed with any mental health disorder or just anxiety disorders tend to have on average nearly 2 more days of sick leave throughout the year, while individuals diagnosed with mood disorders have more than 4.4 additional sick leave days compared to individuals that don't have any mental illnesses. We also found that mentally ill patients are 3-4% more likely to have 4 or more episodes of absence throughout the year. Estimates from a TPM on total payments paid for by the insurer due to sick days suggest a marginal effect of \$160,000 COP per year for patients with mental illness as compared to individuals with no mental illness. To put it in perspective this is equivalent to 50% of the annual amount paid to the insurer from the government for males in the age bracket 19-44, and 27% for those older in working age

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**State of the Extracellular Transport System (Albumin) in
Women of Gomel Region of the Republic of Belarus**

Albumin is a major extracellular transport system. About 1/3 of albumin is within the vascular bed, the other 2/3 are extravasal. A pool of blood albumin and a pool of tissue albumin are exchanged. Therefore, the state of albumin reflects metabolic processes and is an informative system.

The aim of study was to study the conformational state of serum albumin in women in norm and in different pathology. Were studied 63 women (6 groups):

- 10 healthy (1 gr.);
- 9 healthy with full-term pregnancy (2 gr.);
- 11 women with full-term pregnancy with diagnosis: preeclampsia (3 gr.);
- 18 women with full-term pregnancy with diagnosis: iron deficiency anemia (4 gr.);
- 11 patients with diagnosis: cervical cancer, undergoing a split course of radiation therapy (first stage – 30 Gy, with a break of three weeks the second stage – 20 Gy) (5 gr.);
- 4 patients with diagnosis: cervical cancer, undergoing an unsplit course of radiation therapy (40 Gy) (6 gr.).

State of binding sites of serum albumin was estimated by the method [Y.A. Gryzunov et al. *Serum albumin: properties, functions and their evaluation in critical conditions. Anesthesiology and Resuscitation*. 2004; 6: 68-73].

1. The total concentration of serum albumin is within the normal range for all study groups.
2. The values of IT (Index of Toxicity), characterizing the filling of albumin centers by toxic ligands, is close to zero in healthy women (IT=0.05) and healthy with full-term pregnancy

(IT=0.07); but increase in women with full-term pregnancy with diagnosis: preeclampsia (IT=0.14), in women with full-term pregnancy with diagnosis: iron deficiency anemia (IT=0.31) and in cancer patients (IT=0.48 in 5 gr. and IT=0.55 in 6 gr.).

Determination of albumin indicators, characterizing the state of binding sites of serum albumin, can be used as an individual diagnostic and prognostic criterion in the dynamics of patients monitoring with different types of pathology.

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Collective Data Analysis of Correlation between Lung Cancer Incidences and Residential Radon Concentration

Naturally occurring radioactive gas radon is claimed to be responsible for approx. half part of an average annual effective dose for humans. This is the reason why its influence on health of people is a subject of many studies worldwide - especially, when one tries to compare its level of concentration with the number of observed lung cancer cases. The question arises is there any correlation between those two values. We performed collective data analysis for 30 case-controlled studies and 2 ecological ones that were published in past years. Original data single analyses were very confusing, suggesting that the lung cancer morbidity and mortality increase or decrease with increasing radon concentration at concentrations up to 200 - 300 Bq/m³. In all cases the collective data up to 475 Bq/m³ show, within error bars, neither elevated nor diminished risks, so the overall conclusion is that in this concentration range one sees no clear-cut radiation effect. In the next step the data analysis was extended to 838 Bq/m³. This time the analysis was carried out in the whole range of radon concentration, and in 3 sub-regions. In all cases both, least-square fitting and Bayesian analysis of a few simplest models were carried out. The general conclusion is that the model of the independence of the radon risk describes the data in the best way. The best conclusion suggests, in light of the data collected so far, that they are insufficient to support the concept of increased risk of lung cancer for considered low concentrations of residential radon.

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The Critical Importance of Human Cadaver Dissection in the Study of Human Anatomy for Pre-Medical and Pre- Nursing Undergraduate Students

As an Instructor of Human Anatomy for over twenty years at the college and junior college levels, I have discovered that human cadaver dissection is a critical component to this study, especially as it relates to the future pursuit by a select group of my students of careers in the fields of medicine and nursing. The purpose of this paper is to not only justify my contention that cadaver dissection is the *most* important ingredient in teaching this course, but also to demonstrate how it intensifies students' passions for achieving a greater understanding of the anatomy of the human body. Having taught Human Anatomy to classes with and without access to the use of human cadavers for dissection, I firmly believe that the addition of this technique has piqued the fervor for learning of my more gifted students, has given them a greater incentive to pursue careers in medicine or nursing, and has, by their own accounts, greatly improved their performances in subsequent postgraduate medical and nursing school career studies. To substantiate this thesis, I will provide brief descriptions of follow up conversations that I've had with a select group of postgraduate students who've completed my course and who have gone on to complete medical or nursing school.

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**Implementation of IEC Activities to Address Social
Determinants of Health for Holistic Development of under
Privileged Urban Areas, India**

Introduction

Urbanization is an index of transformation from traditional rural economies to modern urban. Even though cities and towns have a vital role in socio-economic changes in any country, most of them are severely stressed in terms of infrastructure and service availability. The Government of India (GOI) has launched Jawaharlal Nehru National Urban Renewal Mission (JnNURM) to encourage cities to initiate steps to bring financially sustainable improvement in the existing service. Integrated Housing and Slum Development Program (IHSDP), a component of JnNURM aims for holistic under privileged area (slum) development, with a healthy and enabling urban environment by providing adequate shelter and basic infrastructure facilities. Under these projects of GOI, it was highly felt that solely by building houses and infrastructure for slum community will not uplift them but there is a need for Information, Education and Communication (IEC). The IEC activities had many objectives to improve quality of life, standard of health, education and standards of living in slum. The activities also encourage skill up-gradation / increase potential income of people living in slums. Identifying health as a major instrument of overall socioeconomic development, involvement of health sector in this project ensures attainment of the basic objective of IHSDP. Hence one of these projects was implemented by public health professionals from a prestigious medical college and research institute in India.

Methodology

The duration for project implementation was 1 year (Feb 2015 to Jan 2016). The project area assigned was 7 slums with 707 households in Kanakapura taluk, Ramanagara district, Karnataka, India. Socio

economic survey was conducted using structured questionnaire. Various IEC activities including health check-ups, awareness programs, skill development, community participation programs etc., were conducted as per the project guidelines.

Results

A total of 2451 individuals were residing in 707 houses of which 50.71% were females. Majority of the survey population belonged to 20-59 years and majority of them were daily waged. 800 people were benefited from the health check-up. 195 youths were given various skill development training. 21 awareness programs were conducted regarding health, environmental sanitation and personal hygiene. Leadership training was given to the members of self-help groups in the community.

Conclusion

The involvement from the community was remarkable as the project was implemented by public health professionals. It is one of the examples for inter-sectoral coordination where non health sector is working with health sector for the holistic development of under privileged population.

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Interstate Inequalities in Disease Burden and Health Expenditure: Evidence from Regional Health Accounts in India

In past decade, evaluation of macro- and micro-economic impact of disease/injury has become an integral part of global growth assessment. The concern is greater for developing nations like India that faces the dual burden of diseases and stands to lose \$4.58 trillion (2015-2030) due to non-communicable diseases alone. On the other hand, communicable diseases like tuberculosis and diarrheal still rank among topmost causes of premature death.

Further, issue of allocative efficiency flags itself with around 63 million being pushed to poverty annually because of high (68 percent) out of pocket expenditure. Though the efforts to estimate and mitigate health care system issues have significantly scaled up at the national level, regional bodies remain under-equipped to make evidence-based policy decisions. This study carries out a retrospective analysis of resource allocation for different functions of healthcare at the state level and it's linkage with disease burden.

To determine resource allocation, System of Health Accounts 2011 framework is employed and disease burden for eight states is determined by Disability Adjusted Life Years (DALY) approach using National Sample Survey data 2014. The study further elaborates on various methodological means, challenges, and limitations of disease burden estimates, economic burden and its link with resource allocation. Further, allocative efficiency is determined by linking DALY and corresponding economic burden to governments' spending at varied levels of care. Preliminary analysis indicates invariably higher DALY across all income-level in rural areas compared to urban. While economic burden remains high for lowest income-level in both rural and urban areas, it declines at a higher rate for the urban population as we move to higher income-level.

Findings of the study would be useful in tailoring health care expenditures at regional level based on population health needs thus

improving technical and allocative efficiency of health systems.

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Spatiotemporal Patterns of Allergic Disease Prevalence in Korea: Looking Beyond Aggregates

A recent 6-year population-based study in Korea reported decreasing trends in the prevalence of atopic dermatitis and asthma at the national level, but the underlying reasons remain unknown. Moreover, further research would be needed to examine whether or not the slowdown has been consistent throughout the country. This paper examines the spatial and temporal patterns of the three types of allergic diseases (allergic rhinitis, atopic dermatitis and asthma) using the patient count data collected at the regional level by the National Health Insurance Corporation (NHIS) of South Korea from 2010 to 2015. It appears that substantially different disease patterns exist between megacities, central and south regions. South regions show a greater fluctuation in prevalence of asthma and atopic dermatitis compared to megacities or central regions, including a huge drop in 2010 and a big rebound in 2011 for all three diseases. We also created maps of the allergic disease prevalence at the sub-district level in Seoul for the 6-year period, which reveals smaller-scale spatial and temporal variations of each allergic disease. The study results highlight that aggregation of disease data over time and space could cause distinctive distribution of diseases to become indiscernible and thus have a possibility to mislead policymakers. A spatiotemporal approach using more disaggregated data is expected to suggest guidance on targeted intervention in terms of effectively preventing allergic diseases.

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HIV/AIDS, Treatment Adherence, and Lifestyle: A Qualitative Study

HIV treatment and medication adherence remain significant to prolonging the life of people with HIV/AIDS. Challenges to and beneficial factors that promote treatment adherence and the maintenance of a healthy HIVpositive lifestyle were examined among N= 100 participants from three HIV/AIDS support networks in California. This study employed an anonymous, open-ended methodology, whereas much of the previous research has used interviews, focus groups, or researcher-generated Likert-type surveys. In addition, most of our participants were from small towns in Central California, whereas past studies in the United States have largely been based on urban samples. Although most of the thematic categories that emerged in our data confirmed previous research, several novel and understudied factors also were important. Implications for health care providers and counselors are discussed.

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Structural Disorder Promotes Phase Separation of C9 or F72 Dipeptide Repeats in ALS

Liquid-liquid phase separation (LLPS) of RNA-binding proteins plays a role in the formation of multiple membrane-less organelles involved in RNA metabolism, including stress granules [1,2]. Defects in stress granule homeostasis constitute a cornerstone of Amyotrophic lateral sclerosis (ALS)/ Frontotemporal lobar degeneration (FTLD) pathogenesis. Polar residues (tyrosine, glutamine) have been previously demonstrated to be critical for phase separation of ALS-linked stress granule proteins. We now identify an active role for arginine-rich domains in these phase separations. Moreover, arginine-rich dipeptide repeats (DPRs) derived from C9orf72 hexanucleotide repeat expansions similarly undergo LLPS, and induce phase separation of a large set of proteins involved in RNA and stress granule metabolism [3]. Expression of arginine-rich DPRs in cells induced spontaneous stress granule assembly that required both eIF2 α phosphorylation and G3BP. Together with recent reports showing that DPRs affect nucleocytoplasmic transport, our results point at an important role for arginine-rich DPRs in the pathogenesis of C9orf72 ALS/FTLD.

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An Empirical Test of Inequality Aversion towards Income and Health

Objective: We estimate inequality aversion towards income inequality, health inequality, and income-related health inequality. We are particularly interested in testing whether inequality aversion differs across income and health.

Methods: We use a stated-preference experiment to empirically estimate the inequality aversion parameters for residents of Ontario, Canada. Respondents are presented with choice scenarios containing two distributions of the relevant outcome, constructed such that if the respondent has an inequality-aversion parameter equal to a pre-specified value they will be indifferent between the distributions. Depending on which distribution they choose, we can infer that their inequality aversion is greater or less than the value assumed. We also examine the association between inequality aversion and individual characteristics.

Results: 1,964 participants took part in the survey. We presented participants with pre-specified inequality aversion (IA) parameters that range from little aversion of inequality (IA parameter = 1.0) to considerable aversion to inequality (IA > 3.0). For income, we find substantial inequality aversion, with a median IA greater than 3 and a mean IA of 3.26; median IA is between 1.5 to 2.0 for income-related health inequality, mean IA of 1.61 –similar to the assumed value for the standard concentration index used in much health equity work. For health, however, preferences appear to be more heterogeneous and complex. There appears to be a strongly bi-modal distribution of inequality in the population, with approximately 51% displaying little inequality aversion (IA < 1.0) and 47.5% displaying substantial inequality aversion (IA > 3.0), mean IA is estimated at 1.38. Females are more egalitarian toward all three domains; university graduates are more egalitarian towards the distribution of health, however, in general

socio-demographic characteristics explain very little of the variation in choices.

Conclusion: Little is known about the publics' attitudes towards inequalities in health, income, and income-related health inequalities. Moreover, these attitudes play a key role in estimates of inequality. By incorporating social preferences that reflect inequality aversion attitudes, conclusions regarding health, income and income-related health inequalities can help inform development of relevant health policies.

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Cost Effectiveness of Home Based Blood Pressure Monitoring Mobile App for Pregnant Women: A Feasibility Study in UK

Hypertension during pregnancy is a quite common medical condition, affecting around 2-3% of the total pregnancies and can lead to serious complications dangerous for both the mother and the fetus.

The aim of this study was to assess the cost-effectiveness of a novel mobile application implemented to enhance the health self-management for pregnant women simultaneously reducing the appointments in the daily assessment units (DAU) and other practices significantly. The data were collected in collaboration St George's University Hospitals NHS Foundation Trust. The dataset included a home-based pressure monitoring (HBPM) cohort and a control group of no-HBM patients. Moreover, the HBM cohort was divided into two main groups, one using the mobile application for logging the blood pressure readings (App-HBPM) and one that was using conventional means (Non-App-HBPM). The application was connected with the patient's electronic records in St George's Hospital for transmitting remote information to the medical practitioners, and automatic referral process initiation in the case of high blood pressure.

To assess the cost-efficiency of the HBPM application, we implemented a multilayer methodology. Our methodology combined the statistical analysis with advanced data visualisations as well as reports on the economic evaluation, combining the clinical data with NICE published studies, NHS reports and national epidemiology data to ensure robustness and generalisability of the findings.

Our findings suggest that home based monitoring of the blood pressure level significantly ($p < 0.05$, $p = 0.000$) reduces the appointments in DAU and the other medical practices. The cost analysis suggested that the use of the mobile application could result in cost savings relative to conventional monitoring with no negative impact on outcomes. These results seem quite promising and should be the subject of a larger study, powered for the necessary size to determine if the Home-monitoring App is clinically and financially advantageous to adopt.

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**Retirement and Health of the Elderly:
Evidence from a Regression Discontinuity Design**

The causal impacts of retirement on the health status of the elderly have attracted academic interests and also have profound policy implication. However, one of the biggest difficulties in estimating those impacts in empirical analysis comes from the endogeneity problem (or reverse causality) that the health status of an elderly may influence his or her retirement decision at the same time. Taking an advantage of the retirement policy which forces people to retire after passing a certain age (age 60 for males and age 55 for females) in urban China, we employ a regression discontinuity approach to estimate the causal impacts of retirement on health. We find that retirement results in a significant decrease in physical health of males in urban China, while no such findings on females. As for mental health, retirement does not show any statistically significant influences on both males and females.