Human Welfare in an Elderly Society
Asset or Burden?

SCIENCE FOR PEACE THE WORLD OVER
-THE NEW MANHATTAN PROJECT-
22 August 2016, Erice, Italy
Sun Kun OH, Konkuk University, Seoul, Korea
1. World demographic change
2. Elderly society
3. Welfare for healthier lives
   [Carreca, Caruso, and Puca]
Proposal to the New Manhattan Project
1. World Demographic Change

- We all know that the world population is increasing.
- The Earth has enjoyed herself to accommodate more than 7 billion human beings on it in 2015.
- Although the rate of increasing is a little bit slowed down, the population will increase up to more than 9 billion in 2050.
1. World Demographic Change

- Mathematically speaking, \( P(t) \), the population as a function of time, is a monotonically increasing function though it may not increase exponentially:
  
  - Its first derivative is always positive.
1. World Demographic Change

The second derivative of $P(t)$ has turned definitely negative for $t > 2015$ and is expected to stay negative afterwards.

Source: U.S. Census Bureau, International Data Base, July 2015 Update.
1. World Demographic Change

- Note that the increasing population is not a global phenomenon because some continents or countries indeed decrease in population due to mainly low fertility rate.

- According to the U.S. Population Reference Bureau (PRB), Europe would find its population decrease whereas the continent of Africa shows the fastest increase.

- Within Africa, Nigeria becomes the most populous country as its population increases from 182 millions in 2015 to 397 millions in 2050. (118% and 215 millions increase)

- [The population of Niger will more than triple during the same period from 18.9 millions to 68 millions.]
## Continents (in billions)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2030</th>
<th>2050</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>1.171</td>
<td>1.658</td>
<td>2.473</td>
<td>111%</td>
</tr>
<tr>
<td>Asia</td>
<td>4.397</td>
<td>4.939</td>
<td>5.324</td>
<td>21%</td>
</tr>
<tr>
<td>Europe</td>
<td>0.742</td>
<td>0.744</td>
<td>0.728</td>
<td>-2%</td>
</tr>
<tr>
<td>USA+ Canada</td>
<td>0.357</td>
<td>0.401</td>
<td>0.445</td>
<td>25%</td>
</tr>
<tr>
<td>The rest of America</td>
<td>0.630</td>
<td>0.716</td>
<td>0.776</td>
<td>23%</td>
</tr>
<tr>
<td>Oceania</td>
<td>0.040</td>
<td>0.048</td>
<td>0.059</td>
<td>48%</td>
</tr>
<tr>
<td>World</td>
<td>7.336</td>
<td>8.505</td>
<td>9.804</td>
<td>34%</td>
</tr>
</tbody>
</table>
Population change in millions

- **Africa**:
  - 2015: 1000
  - 2030: 1500
  - 2050: 2000

- **America**:
  - 2015: 500
  - 2030: 700
  - 2050: 900

- **Asia**:
  - 2015: 600
  - 2030: 800
  - 2050: 1000

- **Europe**:
  - 2015: 150
  - 2030: 170
  - 2050: 190

- **Legend**:
  - Blue: 2030
  - Light Blue: 2015
  - Green: 2050
1. World Demographic Change

- In Asia, the populations in China, Japan and Korea will also shrink mainly due to low fertility. [China will lose its title as the most populous country to India by 2025.]

- On the other hand, the population of Singapore will increase even though fertility rate is very low due to inflow migration.

- The population of Samoa will decrease even though its fertility rate is more than 5 births per woman in her lifetime due to outflow migration.
### Some Asian countries (in millions) [PRB]

<table>
<thead>
<tr>
<th>Country</th>
<th>2015</th>
<th>2030</th>
<th>2050</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1372</td>
<td>1423</td>
<td>1365</td>
<td>-1%</td>
</tr>
<tr>
<td>India</td>
<td>1314</td>
<td>1513</td>
<td>1660</td>
<td>26%</td>
</tr>
<tr>
<td>Japan</td>
<td>127</td>
<td>117</td>
<td>97</td>
<td>-24%</td>
</tr>
<tr>
<td>Korea (combined)</td>
<td>76</td>
<td>79</td>
<td>75</td>
<td>-1%</td>
</tr>
<tr>
<td>South Korea</td>
<td>50</td>
<td>52</td>
<td>48</td>
<td>-4%</td>
</tr>
</tbody>
</table>
Population change vs aging

Source: United Nations 2010
2. Elderly Society

- Note that the fertility rate, the silver tsunami, and the population change are basically independent phenomena.
- Thus, demographic change may differ from country to country.
- Afghanistan, for example, has a high fertility rate and thus will remain relatively young in 2050, but it also faces the silver tsunami with increasing population.
- Korea, due to very low fertility rate and silver tsunami, will become very old with decreased population.
- The general tendency is that the population grows old.
2. Elderly Society

The portion of people over 65 is increasing to reach about 1.5 billions in 2050.
Countries with over 30% of population is 65+ (dark red)
In some countries, the fertility rate is too low to sustain its population without net migration inflow.

In particular, Korea suffers serious low fertility rate.
Korea will follow the pattern of Japan to be a super-aged society
2. Elderly Society

- However, there are some important global, common and universal phenomena that are observed in every country.
- First, the median age of any country will be older in 2050 than today. That is, a typical representative person in every country will be older in 2050 than today.
- Second, the life expectancy of any country will be longer in 2050 than today. That is, a typical representative person in every country will live longer in 2050 than today.
- Thus, the world in 2050 is elderly than today, and will outlive. The longevity.
Median age
Life expectancy (80+ dark red)
2. Elderly Society

- No civilization has advised to avoid longevity. Every people is told to live longer.
- Longevity is a desirable target of life. Indeed, it is regarded as one of the most important factors of happiness, in particular in the ancient China.
- The elderly society is therefore acceptable and desirable, and will be realized in the foreseeable future.
- Longevity is a natural progress in human history of development.
2. Elderly Society

► Thus, the elderly society may not be a kind of planetary emergencies.

► It is not an issue to be clarified nor a problem to be solved.

► Nevertheless, we should prepare and plan to meet the elderly society in the future. In this sense, it is a challenge.

► It seems that the world is reluctant to welcome the elderly society.
It is not so welcomed …
One of the greatest health challenges Canada faces over the next decade is the "grey tsunami" - the tide of chronic diseases rising from an aging population which threatens to swamp our health care system, economy, and quality of life.

Rhetorical technique of exaggeration, escalation:

fear-mongering
3. Welfare for the healthier lives


- All of these three factors are indispensable for the happy longevity.

- Among them, health comes first and wealth comes last, although money matters in everyday life. The financial security nor the human relationship will not be discussed since they are not scientific subjects.
3. Welfare for the healthier lives

- Korean statistics in 2014 (biannual survey) showed that:
  - Korean male would live 79 years with his last 14.1 years in certain illnesses (6.1 years seriously ill).
  - Korean female would live 85.5 years with her last 19.6 years in certain illnesses (7.5 years seriously ill).
3. Welfare for the healthier lives

The cost of medical care for 65+ is estimated in 2014 to be about 3,300 USD per person, and amounts to 19.97 billion USD in total, and 4.2 times larger than the cost of medical care for 65-.. By 2060, it would sum to be equal to 2016 national budget.
3. Welfare for the healthier lives

- The health of elderly people is therefore very crucial for the sustainable economic stability.
- Social consent is required for the high cost of medical cares for the elderly society.
- Treatment of age-related diseases are essential.
- Our colleagues Prof. Ignazio Carreca, Prof. Calogero Caruso, and Prof. Annibale Puca will deal with the subject of healthier lives.
150th Course
Geriatrics, Molecular and Clinical Oncology: an Overview
A Postgraduate Course

Directors of Course:
Prof. I. Carreca
Prof. C. Caruso
Prof. A. Russo

Erice
April, 27th / 29th 2015
Ettore Majorana Center for Scientific Culture
(Director: Prof. A. Zichichi) - Erice (TP) - Italy

INTERNATIONAL SCHOOL OF MEDICINE
Director of the School: A. Zichichi

150th Course
Geriatrics, Molecular and Clinical Oncology: an Overview
A Postgraduate Course

L’evento è stato realizzato con il supporto non condizionante di:

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Boehringer Ingelheim
Celgene
Eisai
IPSEN
Janssen-Cilag
Lilly
Merck Serono
Novartis

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INTERNATIONAL SCHOOL OF MEDICAL SCIENCES

13th Course: Genetic counselling and rare disorders
Director: I. Carreira
20 – 24 November 2016

INTERNATIONAL SCHOOL OF UROLOGY AND NEPHROLOGY

Director: C. Payone
17th Course: Nephrology and lower urinary tract endoscopy
Directors: L. DeFazio – A. Patel – C. Payone
27 – 30 November 2016

INTERNATIONAL SCHOOL OF BRAIN CELLS AND CIRCUITS - CAMILLO FUGAZZO

Director: E. D’Angelo – G. Gandini Wheeler-Kingshott
2nd Course: The development inside-out: Cells, circuits and functions
Directors: E. D’Angelo – G. Gandini Wheeler-Kingshott
1 – 5 December 2016

INTERNATIONAL SCHOOL OF MEDICAL SCIENCES

15th Course: Nematology
Director: G. Corsello – D. Lo Cascio
3 December 2016

INTERNATIONAL SCHOOL OF EPIDEMIOLOGY AND PREVENTIVE MEDICINE - GIUSEPPE D’ALESSANDRO

Director: O.M. Fara – G. Grammanco
42nd Course: Epidemiology for planning, implementation and evaluation in public health
Directors: F. Donato – G. Grammanco
3 – 7 December 2016

INTERNATIONAL SCHOOL OF CARDIOLOGY

Director: A. Branzi - P. Zabialis
10th Workshop: Heart and lung interactions
Director: S. Novo
8 – 10 December 2016

INTERNATIONAL SCHOOL OF GERONTOLOGY AND GERIATRICS - GIUSEPPE BARBAGALLO-SANGIORGI

12th Course: Geriatrics
Director: M. Barbargallo
8 – 11 December 2016

More information about the activities of the Ettore Majorana Foundation can be found on the WWW at the following address:
http://www.ettormajorana.it
4. Proposal to the New Manhattan Project (NMP)

The activities of the center should:

- seek the answers to, for example, “Can we comfortably accept the elderly society where more than 10 % of total population is 80+?”

- produce some concrete scientific results for reference or forecast on the welfare of an elderly society,

- suggest recommendations when necessary,

- cooperate with other organizations such as UN or WHO of relevant subjects but not losing the authenticity and independence of EMC/WFS.
4. Proposal to the NMP

- Terms of References which should include:
  - The vision, prospective, aim and scope of the center
  - Location of the center, probably in Erice
  - Regular meetings (twice a year) with joint activities
  - Report of activities to the Erice Seminar NMP
  - Bureau of secretariat
  - Budget responsibility
4. Proposal to the NMP

- The members of WFS are invited to join. Also, experts recommended by them are also welcome. The list of participants will be completed by the end of 2016.
- The proposal will be reviewed during the Erice Seminar this year for feasibility and applicability.
# Executive summary for 3-year activities

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>To submit to the Erice Seminar a perspective report 2020</td>
</tr>
<tr>
<td>Time frame</td>
<td>[1] Proposal presentation to the Erice Seminar, August 2016; [2] The steering committee and/or the expert group formation by the end of 2016;</td>
</tr>
</tbody>
</table>

## Contents of report

- To submit to the Erice Seminar a perspective report 2020
- Proposal presentation to the Erice Seminar, August 2016
- The steering committee and/or the expert group formation by the end of 2016
- Kick-off meeting of the steering committee by the end of 2016
- 5-6 biannual meetings within 3 years (alternating meetings in Erice and elsewhere) 2017-2019
- Status presentation every year at the Erice Seminar
- Draft of final report before May 2020
- Submission of report to the Erice Seminar in August 2020
Host responsibility for satellite meeting

- The meeting cost (meeting place operation, beam projector, copy/scan/fax machine, internet equipment, consumables, coffee breaks, etc.)
- Administration (distribution of meeting documents, maintaining networks among participants, operating e-mail system)
- Report to the Erice Seminar in August each year
- The host and the venue for satellite meeting is chosen by consensus on rotating basis
Report to Erice may include:

- Status quo of demographic transformation;
- Case studies of the elderly society (urban life);
- SWOT of the elderly society;
- The challenges of the elderly society;
- Asset as well as burden;
- An acceptable strategy for the redistribution (i.e. migration) of continental disparity in population? Etc.
## Budget estimation

<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,000 EUR (3,000 EUR per year)</td>
<td>3 meetings in Erice</td>
<td>One-day meeting annexed to the Erice Seminar will be held. The overall administration will be under the auspice of WFS.</td>
</tr>
<tr>
<td>18,000 EUR (6,000 EUR per meeting)</td>
<td>3 meetings elsewhere (Possibly in Italy, or Germany)</td>
<td>Personal cost of participants should be borne by themselves. The local host of the outside meeting should secure the budget for organizing the meeting.</td>
</tr>
</tbody>
</table>
backups
3. Welfare for the healthier lives

- Having a good circle of friends/family is a very important condition for happy longevity.
- Some IT gears may help enhancing the human relationship.
- Health is in the realm of science. Our colleagues Prof. Ignazio Carreca, Calogero Caruso, and Annibale Puca will deal with the subject of health.
Korean life expectancy