The Triumph of Science over Death*
Baldomero Roxas Memorial Lecture (2017)

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It is a great honor and with profound humility that I receive the Dr. Baldomero Roxas Award for Academic Excellence and to join the list of eminent persons in the field of Obstetrics and Gynecology - many of whom were my esteemed mentors, and sources of inspiration. I am also thankful to have been under their tutelage. It is indeed a distinct privilege to be able to honor Dr. Baldomero Roxas, after whom this highest award is named with this memorial lecture. But indeed, after all these years as a lifetime fellow of the POGS, I have very little knowledge of who the man is, and why we are all gathered here today and every year to honor him. Preparing for this lecture has given me more and deeper insight on how each one of us, can be like Dr. Baldomero Roxas, and give our own little contributions.

Using the very limited but important documents in our local journals and the internet, we learn that Dr. Roxas was born in Lipa, Batangas on 27 February 1869, a descendant of patrician families. He earned his AB degree from Ateneo Municipal in 1885, after which he enrolled at the Faculty of Medicine at the University of Santo Tomas[1]. His studies were interrupted by problems in the family coffee business, which delayed his completing the Doctor of Medicine degree by a few years from Universidad Central de Madrid in 1897. He had formal postgraduate training in Surgery, Obstetrics and Gynecology in various hospitals in Spain, lastly at El Hospital de San Carlos[2]. Before returning to the Philippines, on one of his trips abroad, he saw the Polyclinic in Rome, presumably Agostino Gemelli University Polyclinic, where he got the idea for the architectural details for the Philippine General Hospital.

In 1907, the Philippine Medical School opened and he was appointed Assistant Professor in Obstetrics by his colleague, Dr. Fernando Calderon. He later became head of the department in 1922, and served until he retired at age 75, and had become the longest serving head of the department. He stayed on as Professor Emeritus of the university. Throughout his academic career, he was recognized as an outstanding teacher, a Williams in his own line, and was interestingly described with these words: *He is remembered being well dressed and erect and impressive, with the agility of a military officer, tobacco at a corner of his mouth, with an ornate walking stick and guided by a valet, talking with a hoarse voice often punctuated by short coughs to clear his throat.*

The Philippine Obstetrical and Gynecological Society initiated the annual Baldomero Roxas Memorial Lecture and Award, at his centenary in 1969 to celebrate his life and contributions to medicine.

While his medical career was more familiar to us, we learn about his other achievements of a national fervor were also interesting and inspiring. While he pursued his studies in Spain, he became a close friend of Jose Rizal, in 1889. He even became part of the Kidlat Club, a group formed by Rizal initially for camaraderie, but later was renamed Los Indios Bravos, which we are more familiar with and which has the goal to excel in intellectual and physical prowess to win the admiration of foreigners, especially the Spaniards. Its members practiced with the great enthusiasm the use of the sword and pistol, and judo which Rizal taught them. There was also a secret society, the R.D.L.M. Society - Redencion de los Malayos (Redemption of the Malays), which was patterned after Freemasonry. Only a few trusted friends of Rizal became members: Gregorio Aguilera, Jose Ma. Basa, Julio Llorente, Marcelo H. delPilar, Mariano Ponce, Baldomero Roxas & Father Jose Maria Changco (Filipino priest). Its aim was "the propagation of all useful knowledge – scientific, artistic, literary, etc. – in the Philippines & the Redemption of the Malay Race".[3]

Upon his return to the Philippines, Dr. Roxas participated in the second phase of the revolution against Spain under President Emilio Aguinaldo. After the signing of the Pact of Biak na Bato, he involved himself, as a newspaperman and publisher, in promoting the nationalist cause. Known as Kapitan Berong. He fought the Americans with his pen, under the pseudonyms Dr. Panglos, based on a character in Voltaire's Candide, and Lumiere Rouge. Obviously he was similarly a man of medicine and of his homeland, like Jose Rizal.

Dr. Jose Rizal (who is also honored by the Philippine Medical Association with a distinguished award given annually in his name) had spent so much time in Europe, he even got to visit Geneva for two weeks in 1887. He was also very good friends with Mr. Ferdinand Blumentritt, an educator from Prague, then in Austria-Hungarian Empire. In 1890 Rizal gave Blumentritt some small statues or

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sculpture, one of which is quite familiar to some of us. Also known as Scientia, this is the Triumph of Science over Death. The statue depicts a young, nude woman with flowing hair, standing on a skull while bearing a torch. The woman symbolizes the ignorance of humankind during the Dark Ages of history, while the torch she bears symbolizes the enlightenment science brings to the world. The woman stands atop a skull, a symbol of death, to signify the victory that humankind aims to achieve by conquering the bane of death through scientific advancement.[4] It is found at many buildings, including the Department of Health compound in Alabang and the UP College of Medicine in Ermita.

The message of this sculpture is that with science we can conquer death and save lives. And thus is the title of this lecture. How and why should we use science and knowledge in saving lives? What are events in the past to the present that have shown how science has contributed as evidence for health? How can we use and apply scientific evidence in present times? How does science save women from dying? What are some implementation issues?

As young students, we were brought up using the scientific method. We observed that the sprouting mongo seed was more healthy looking when exposed to sunlight, yet we also see the attempt of the young sprouts denied of sunlight to survive by having a longer though not healthier stems. We saw and used many other experiments that compare one event with another, especially noting those which show the same results with repeated attempts. And from these, we learned to make conclusions based on these comparisons, hopefully to be applied in our day to day lives.

When we became physicians, we took the Oath of Hippocrates which had an original document and a modern version. The latter says: *I will respect the hard worn scientific gains of those physicians on whose steps I walk, and gladly share such knowledge as is mine with those to follow*. We thus are committed not only to use what the others have learned in the past, but also to find new discoveries and innovations to contribute to the body of knowledge.[5-7]

The role of science in influencing health in our present lives was eloquently described in the Howard Taylor Distinguished Lecture in the FIGO Vancouver in 2015 by Dr. Herbert Peterson, who used to work in WHO, and still provides support to it. In his lecture which was later published in Obstetrics and Gynecology in 2016 as Great Moments of Global Health, and Why We are in One Now, he most eloquently described 3 great events that influenced present practice based on the vision and inspiration provided by great men of science and medicine.[8]

Ignaz Semmelweis in 1847 noted that those women who delivered in the First Obstetrical Clinic in Vienna had a higher puerperal fever compared to those who delivered in the streets. He concluded that the students were transmitting cadaveric particles, and he thus instituted a policy of hand washing with calcium hypochlorite in between autopsies and patient examinations. There was a reduction of mortality by 90%. His observations were later used by Louis Pasteur and Joseph Lister in defining the germ theory and in promoting antisepsis during surgery.[8]

John Snow mapped the occurrence of cases of cholera in London and determined that they clustered along the public water pump on Broad Street, giving evidence of waterborne transmission of disease. He is considered the father of epidemiology, which is considered the basic science of public health. And epidemiology has transformed the practice of medicine as well. More about this later.[8]

Edward Jenner pioneered the first vaccine, against small pox, initially inoculating his gardener's son with cowpox, and concluding protection. Smallpox was attributed with 300 to 500 million deaths in the 20th century, but has now been almost totally eradicated, especially after innovations in health systems were delivered.[8]

These and other events in medicine, has brought us through other great events in health to the present times, when in 2015, leaders from 193 nations gathered at the United Nations and declared their commitment to the **17 Sustainable Development Goals**. This agenda is a promise to all people everywhere, including good health and well being and gender equality. The next day, the UN Secretary General launched a UN Strategy with goals that include eliminating preventable deaths of women, children, and adolescents, everywhere by 2030, with much energy of purpose and commitment. The WHO Department of RHR has been guided by the Global Reproductive Health

Strategy also adopted by the World Health Assembly.

These developments and strategies have thus addressed a big concern brought up by Dr. Mahmoud Fathalla, who has stated in the FIGO World Congress in

Obstetrics and Gynecology in 2000; ***Women are not dying of diseases we cannot treat, They are dying because societies have yet to make the decisions that their lives are worth saving***.[8]

We thus have this very recent great moment, and we have come a long way. And we are in a great position as the Philippine Obstetrical and Gyncological Society to be and continue to be the important steward for women's health care in this century for the Philippines.

Aside from being an obstetrician gynecologist and a health professions educator, I have had the great opportunity to also practice as an epidemiologist and to use these in my clinical work. Epidemiology is the study of the distribution and determinants of health-related states or events (including disease), and the application of this study to the control of diseases and other health problems. Clinical epidemiology is applied by physicians who had extensive training and experience in clinical medicine and thus provide direct patient care, of epidemiologic and biometric methods to the study of diagnostic and therapeutic process in order to effect an improvement in health. It reflects an orientation arising from both clinical medicine and epidemiology. There have been many who have also pursued this path, including those who have been recognized by the society tonight and in recent years.[9]

How can we use these various knowledge and skills to improve health, prevent illness and save lives? Through the years, several movements have taken place and many methods have been developed. Among these methods include.

- Establish global standards for local use and adaption
- Use of evidence (through research synthesis) to develop these standards as guidelines using a transparent and robust process.
- Policy development to enable implementation of guidance
- Documentation of experiences

Among the most popular standards that have been developed in recent times are practice guidelines. These are generally statements that recommend specific practices based on evidence from high quality categories of research, and assessed for its applicability. There are several ways how guidelines are developed. But like science in general, there are more and more ways of improving the development of guidelines.

As a young consultant, I was asked to participate in one of the first clinical practice guidelines developed by POGS, on hypertension in pregnancy, using my competencies in clinical practice and epidemiology. Long discussions were made at that time regarding process, criteria, and implementation of the guideline which was among the first of many that have been developed since. And there are new ones are in development. Among the topics that POGS has developed guidelines on include: Abortion, Intrapartum and postpartum care, Abnormal uterine bleeding, Congenital Malformations and Anomalies, Family Planning, Immunization for Filipino Women, Uterine Leiomyoma.[10]

The World Health Organization has been the global UN agency working on norms and standards for health and our department has been developing guidelines on sexual and reproductive health for several decades now. With time there have been many changes and improvement in standards, processes, and methodology, to ensure quality control. The highlighted topics show which ones POGS have also as guidelines in part or completely: **Cervical cancer, Contraception, Pregnancy and nutrition, Pregnancy and childbirth, Preventing unsafe abortion**, Female Genital Mutilation, Infertility, Sexually transmitted infections, including HIV, Violence against women, and Women's health.[11,12]

With guideline development, there are also the issues of evidence generation and accountability. Countries and concerned parties not only question the statements being recommended, but more so on the process how the statements were arrived at. The questions include.

- How the topics for review are selected?
- What is the basis for finding and selecting evidence?
- What is the process for combining evidence from various sources?
- Who were involved in the guideline development?
- How do we objectively standardize quality assessment of evidence?
- How do we make recommendations?
- What do we do with the recommendations?

There is another WHO office that produces the global standards for clinical and programmatic guidance through this process with the internal regulations and standards for developing guidelines, which are available in the *WHO Handbook for guideline development*. The WHO Guidelines Review Committee (GRC) monitors the guideline development process and ensures that the relevant regulations and standards are applied. The evidence for guidelines includes defining what are we looking for and where, the potential *benefits and harms*

– *safety, the acceptability* of different options to patients, health workers and others, the feasibility of different options and the resources required.[13]

Prioritise problems & scoping
⇩
Establish guideline panel and develop questions, including outcomes
⇩
Find and critically appraise systematic review(s)
and/or
Prepare protocol(s) for systematic review(s)
and
Prepare systematic review(s)
(searches, selection of studies, data collection and analysis)
⇩
Prepare an evidence profile
⇩
Assess the quality of evidence for each outcome
⇩
Prepare a Summary of Findings table
⇩
If developing guidelines:
Assess the overall quality of evidence
and
Decide on the direction (which alternative) and strength of the recommendation
⇩
Draft guideline
⇩
Consult with stakeholders and/or external peer reviewers
⇩
Disseminate guidelines
⇩
Update review or guidelines when needed
⇩
Adapt guidelines, if needed
⇩
Prioritise guidelines/recommendations for implementation
⇩
Implement or support implementation of the guidelines
⇩
Evaluate the impact of the guidelines and implementation strategies
⇩
Update systematic review/guidelines

Figure 1

In summary, the process includes:

1. identification of priority questions and critical outcomes;
2. retrieval of the evidence;
3. assessment and synthesis of the evidence;
4. formulation of recommendations;
5. planning for dissemination, implementation, impact evaluation and updating.

The process follows the Grades of Recommendation Assessment, Development and Evaluation or GRADE system which looks at the quality of evidence and whether a strong or otherwise recommendation can be made. This is a product of an international group of developers, methodologists, and clinicians in 2000, with the aim of developing a common, transparent and sensible system for grading the quality of evidence and the strength of recommendations (from a previous option of over 100 systems).[14]

The GRADE approach defines the clear separation of two issues : the quality of the evidence and the strength of the recommendation. The quality of the evidence is *the extent to which one can be confident that an estimate of effect or association is correct, and may be* high, moderate, low, or very low. These could include the methodological quality of evidence, likelihood of bias, or the choice of outcome. The strength of the recommendation may be *Strong or Weak/ Conditional/ Qualified (for or against). These may be based on* desirable and undesirable effects; quality of available evidence; values and preferences related to interventions in different settings; the cost of options available to health-care workers in different settings; and the perceived likelihood of the recommendation being modified as a result of further research. There are GRADE and methodological specialists who provide technical and independent assessment of the evidence gathered for the guideline development.[14]

The figure below (Figure 2) shows the hierarchy of evidence that is used for the development of guidelines and in designing research methods. The filtered information already provides some level of assessment by the authors who prepared them while the lower unfiltered information would need further evaluation before being considered for making recommendations. The higher quality studies would factor in highly in the evaluation of the strength of the evidence. We would much prefer to use the findings of systematic reviews over those of individual research studies.

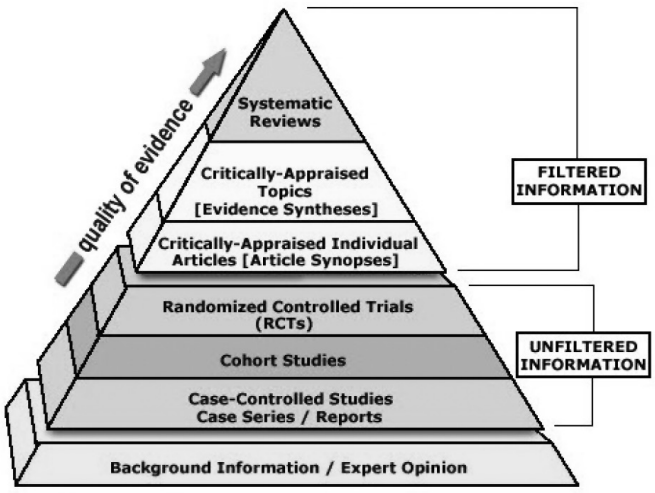


Figure 2

One strong determinant in the assessment of the evidence would be the study design of the research. Generally when considering individual studies, randomized clinical trials or RCTs start high, whereas observational

studies start low. There are other factors that **lower the quality of evidence, which include:** Limitations of the studies, in design and execution, Inconsistency of findings across various independent studies, Indirectness of the results, Imprecision of the results, and Reporting bias. There are also some factors that **raise the quality of the evidence**, large magnitude of effect can upgrade one level, a dose response relation, and the effect that residual confounding unlikely to be responsible for observed effect.

POGS uses the Appraisal of Guidelines for Research and Evaluation or AGREE system in evaluating and appraising its guidelines as quality control. This system uses criteria in evaluating/SCORING the following DOMAINS in **existing guidelines, to include: scope and purpose, clarity of presentation, applicability, stakeholder involvement, rigor of development, and editorial independence**. A quick review of a few CPGs in recent years showed need for improvement in the last three domains. Are all those who are delivering this type of care involved in the discussions, and how about the targets, the patients, were their concerns addressed? We need to describe more the process of development, especially on how studies were assessed to be for inclusion and for exclusion, and were they good enough or were they problematic. How independent was the development process? Were conflicts of interest duly addressed?[15]

I have been fortunate to have learned much from my academic and administrative work at the University of the Philippines, my clinical practice at the Philippine General Hospital and other medical centers, and my professional networking through the POGS and PSMFM. There were many opportunities as well to contribute nationally through consultancies at the Department of Health and other government agencies. I now bring these present competencies to the international arena, with my present work at WHO which has been mostly on family planning and contraception. While the topic is controversial, and challenging, we have to admit that many interesting recent developments are happening in this field.

The London Summit has been convened by BMGF, UK, USAID, to address the need **120 million new users of modern contraceptives by 2020, t**o address the unmet need for modern contraception. Factors that have been defined to ensure meeting this goal include **providing commodities, improving quality of care services, approaching with a gender and rights perspective, and using adequately trained health providers.** The Philippines is a FP 2020 priority country.

Women with unmet need are **fecund and sexually active** but are **not using any method of contraception,** and report **not wanting any more children or wanting to delay the next child.** The concept shows the gap between women's **reproductive intentions** and their **contraceptive behavior.** What they want or intent to have is not necessarily reflected in what they are doing. There are certain sectors of society with a high unmet need for modern contraception, such as adolescents, migrants, urban slum dwellers, refugees, and women in the post-partum period. The Philippines has great numbers of these groups of women.

Globally, as of 2017 based on the Guttmacher Institutes Adding It Up report, (16), **1.6 billion women** of reproductive age (15-49) live in developing regions. 885 million women want to avoid a pregnancy; of this, **about three-quarters (671 million) are using modern contraceptives.** 214 million women of reproductive age in developing regions with unmet need for modern contraception, **155 million who use no method of contraception, and 59 million who rely on traditional methods.**

The proportion of women who have an unmet need for **modern contraception are** highest in Sub-Saharan Africa (21%), but the largest absolute number (70 million women) live in Southern Asia. 39% of all women in developing regions who want to avoid pregnancy with **57% of women with an unmet need for modern contraception.** Of the estimated 206 million pregnancies in 2017 in developing regions, **43% are unintended** (that is, they occur too soon or are not wanted at all). Programmes on modern contraception estimate the these can prevent an estimated 307 million unintended pregnancies annually developing regions. If unmet need for modern contraception were satisfied in developing regions, the following effects are expected:

- Three-quarters **decline in unintended pregnancies** (from 89 million to 22 million per year),
- **Decline in unplanned births** (from 30 million to seven million per year)
- **Decline in induced abortions** (from 48 million to 13 million per year).
- Result in an estimated 76,000 **fewer maternal deaths** each year (16)

But as with any program that involves sexual and reproductive health, including maternal health care, sexually transmitted infections, infertility, menopause, and oncology, there are many implementation issues that need to be considered. Rights and equity are often misunderstood and unimplemented. Equity is the absence of avoidable or remediable differences among groups of people, whatever their background demographics will be. Each sector would thus have equal or equitable access to health care. Reducing equity in health is a fundamental human right.

Rights in reproductive health are expected to be respected but are often denied. WHO recommendations for programmes have been established to ensure that human rights are respected, protected and fulfilled, while services are scaled up to reduce unmet need for contraception, and other services. In guideline development Health data and international human rights laws and treaties were incorporated into the guidance. Health care is a fundamental human right and that access to health care should also follow some principles as stated in the framework for ensuring human rights. We are presently completing an ongoing review shows that some of the laws and policies in the Philippines are not strong enough to address the issues elucidated these WHO guidelines. The issues are listed in the table below.

1. Non-discrimination in the provision of contraceptive information and services
2. Availabilty of contraceptive information and services
3. Accessibility of contraceptive information and services
4. Acceptability of contraceptive information and services
5. Quality of contraceptive information and services
6. Informed decision making in provision of contraceptive information and services
7. Privacy and confidentiality of contraceptive information and services
8. Participation in provision of contraceptive information and services
9. Accountability in provision of contraceptive information and services[17]

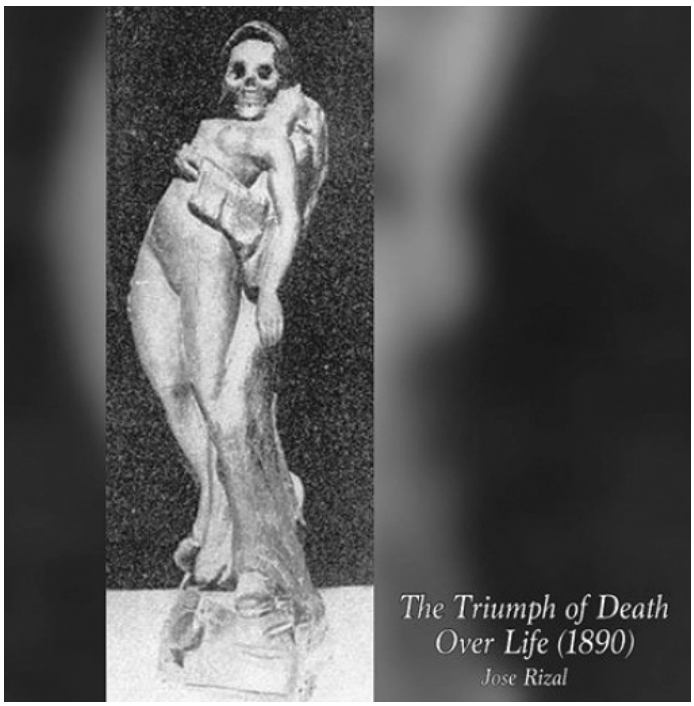
Commodities refer to the various drugs, medications, medical equipment and devices that are needed in the provision of services. In family planning, the 5**1 contraceptive products,** including the implants, that were covered by the temporary restraining order (TRO) of the Supreme Court, have been determined to be non-abortifacient, or **cannot cause abortion,** by the Food and Drug Administration (FDA). In **Advisory No. 2017-302** dated Nov. 11, 2017, the FDA said it has already concluded the re-evaluation of the 51 contraceptive products.[18,19]

Community participation is very important in the promotion of various health programmes and involves the involvement of affected or targeted populations in all stages of decision making and implementation of policies programmes and services, reflecting their needs and perspectives. Among the important movements that this was most important include the convention on the elimination of all forms of discrimination against women, and the recent movements to address sexual abuse and harassment in the work place.

Policies are very important as these reflect the enactment of important decisions by leaders and political will and commitments. The responsible parenthood bill **(RH LAW! R.A. No. 10354 (Responsible Parenthood and Reproductive Health Act)** had a long history, and had gone many revisions. The executive order on attaining zero unmet need **E.A. 12 Attaining and Sustaining Zero Unmet Need for Modern FP, through Strict Implementation of RH LAW** has been addressed by the current presidency.

The newly apppinted Director General of the WHO Dr. Tedros Adhanom Ghebreyesus **has stated that** "Family planning is one of the best buys that exist for global development. SRH is a priority for universal health care."

Going back to Rizal and Blumentritt, our national hero also gave another statue to his friend, this status of death triumphant over life. It is scary, worrisome, and is not as well known. Yet there must be a reason why both statues were made. But easily there is an obvious choice on which path to follow, and which to prevent.



We should all work to ensure that science triumphs over death.

I also thank my colleagues in work and service, at UP PGH, at POGS, and all other societies and organizations I have been fortunate to have been part of. We all contribute our small inputs to come up with a satisfying yet important output. I am also very happy to have my family here, my sisters, my brothers' families, and my friends, to share in this joyous occasion. We have also suffered some losses and hardships, and this recognition uplifts not my spirit but theirs as well.

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