Health Ripples

The UP Manila Health and Life Magazine

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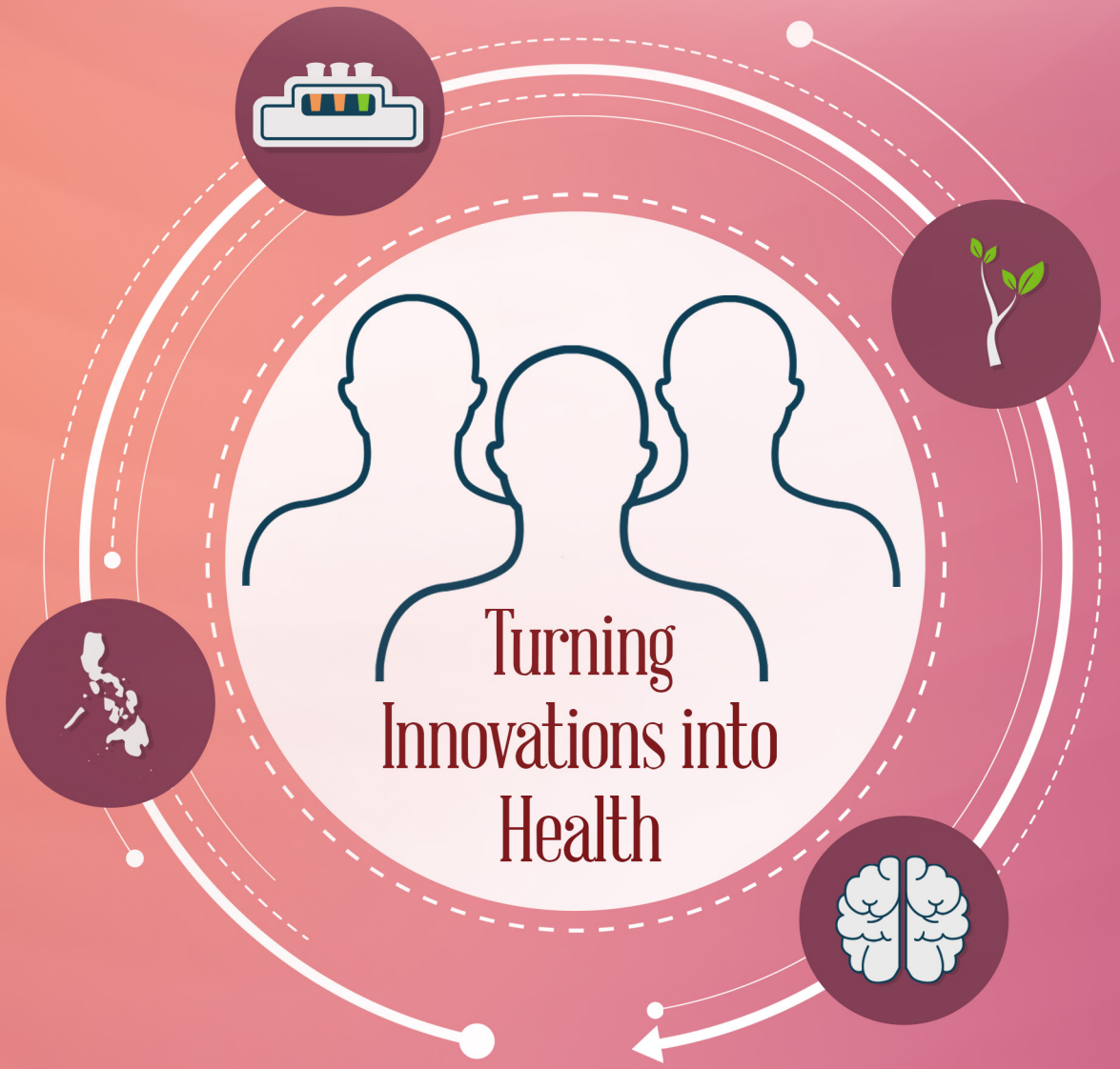

Turning Innovations into Health

Health Ripples
The UP Manila Health and Life Magazine

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Editor's Notes

Innovations for Better Health

This issue highlights the role of research in health. The six articles delve into the most important aspects of the environment that feeds research: a conducive and supportive setting or milieu that empowers the scientist, the organizational and physical infrastructure, and the scientist/researcher's passion and commitment that lead to the high quality and relevance of the researches being undertaken.

As the Philippines' recognized authority and central body on health researches, the National Institutes of Health (NIH) takes pride in its achievements and contributions to health improvement. NIH researches have been helping Filipinos cope better with illness. NIH researches have been sparing our people from further suffering. NIH researches have been increasing the chances for our people to live longer and better. Let the write-ups talk.

The first article is the keynote speech delivered by National Scientist, University Professor Emeritus and Ramon Magsaysay awardee Dr. Ernesto O. Domingo during the 2015 anniversary celebration of the NIH. The speech focused on strategies and requirements to empower the Filipino scientist which was the theme of the celebration.

With the provision of a conducive environment for research through the NIH as lead agency mentioned by Dr. Domingo in his speech, the next article recounts the development of the Institute from its beginnings in 1996. The article tackles how the NIH has developed into a full-fledged unit and vast network of multi-specialty researchers generating and applying technologies that guide and shape national health policies and programs.

Through its nearly two decades of leadership in health research and development, the NIH has been a driving force behind many innovations and advances that have contributed much to improving the Filipinos' health. The third article zeroes in on one of such breakthroughs in the field of health diagnostics: the discovery of a cheaper, faster, and more accurate diagnostic kit for dengue that harnesses the power of molecular-based technology to detect the presence of the fatal infection in the first 0 to 5 days of illness. A team led by Dr. Raul Destura is behind this technology.

How did Dr. Destura's team achieve this and what were the travails the award-winning molecular biologist encountered? The sketch on Dr. Destura will hopefully provide a realistic but encouraging and inspiring portrait of the scientist/researcher as a Filipino in the fourth article.

Featured in the next article are the researches on herbal medicines being done by the Institute of Herbal Medicine (IHM) as it finds its niche in medicine. It also looks into the seeds sown by a team of researchers that are now being built on and further cultivated by the IHM.

Lastly, the article on the Philippine Health Information System-Mental Health Conditions (PHIS-MHC) mirrors the state of mental health disorders in the country. The lack of significant research data affects the planning and development of programs that lead to low government priority for improvement in mental health facilities and personnel. The thick wall of denials by and the stigma on the sufferers and their families make it hard to get proper medical assessment and treatment.

The above are only some of the NIH researches that are advancing the frontiers of health and which have not been amply covered in the previous information materials of the university, the way other NIH research programs have been, such as newborn screening, newborn hearing screening, vision screening, rare disorders, and telehealth.

Empowering the FILIPINO SCIENTIST*

Ernesto O. Domingo, MD
National Scientist, Ramon Magsaysay Awardee, University Professor Emeritus

To empower our scientists and researchers so that they will contribute to nation-building via scientific productivity, an institution like the National Institutes of Health should provide the necessary policies and practices that assure that the scientists can do their work optimally.

DOH Undersecretary Dr. Kenneth Hartigan-Go, UPM Chancellor Dr. Carmencita Padilla, Vice Chancellor for Research and NIH Executive Director Dr. Eva Cutiongco-Dela Paz, PCHRD Exec. Director Dr. Jaime Montoya, UPCM Dean Dr. Agnes Mejia, colleagues, participants, and guests, good morning.

Let me start by greeting the National Institute of Health (NIH) a happy 18th birthday! In human terms, the NIH is one year shy of the end of the teen years, a transition point to early adulthood. For people as well as institutions, this transition requires a lot of stock-taking in order to plan for the responsibility-laden years ahead. I surmise that this occasion is, in fact, part of that planning.

It would not be amiss to recount to you a short story about the celebrant as we are wont to do if the NIH were a person. Maybe the story will be accompanied by a video presentation even, which I am not prepared to do now so bear with me in this short biographical sketch of the NIH.

Dr. Ernesto Domingo with Supreme Court Chief Justice Lourdes Sereno after receiving his Ramon Magsaysay award in 2014

Strictly speaking the NIH as a research institution is actually 28 years old. Here is why:

In 1988, with the appointment of a new University President, UP Manila was reorganized. I was a member of the reorganization committee. And before I proceed any further, I would like to tell you that I have a number of stories to tell in this talk, many personal in nature for which I beg your indulgence. The reason is, like the parable, a story drives home a point without any need for elaborate

** Keynote speech delivered during the 18th Anniversary of the National Institutes of Health of UP Manila, 14th University Science and Technology Week, and 7th Anniversary of the Metro Manila Health Research and Development Consortium (MMHRDC) held on February 17-18, 2016 at the SMX Convention Center, SM Mall of Asia, Pasay City*

Dr. Domingo leads the opening of the NIH anniversary exhibits in one of its annual celebrations.

explanation.

To resume my story: my task in the committee was to propose the policy and the mechanism for implementation of two major university activities. The first was university governance and the second, enhancing research in the university.

Since it was just two years after EDSA I, we were all still intoxicated with the newly recovered freedom and democracy, so I proposed a democratized governance system for UP Manila (UPM). When it was adopted and implemented, the result was a complete disaster. I soon learned from this experience that the University, by its very nature, is ELITIST and that governing it along democratic principles as practiced in political governance can ruin it.

As to the second assignment, I recommended the creation of the Institute for Socio-Biomedical Research (ISBMR) as the mechanism for enhancing research in the university. The objectives of the ISBMR were the following:

1. To house under one roof all the research laboratories and facilities in UPM;

2. To functionally and administratively integrate all research activities; and

3. To merge social sciences research with biomedical research in recognition of the truism that winning the scientific argument does not necessarily move people into action.

> The reason why there is a Socio in ISBMR is because it is the social sciences that will move people into action when the scientific argument is won by the biomedical scientists.

Put in another perspective, this truism implies that good scientific output does not necessarily find their way into pertinent policies, which, in the case of UPM, refers to public health policies. Hence, the need to enlist the help of the social scientists to move people into action.

It was also envisioned then that the ISBMR will have its core staff but its facilities will be open to all the academic research personnel of the various schools and colleges in UPM who may do their research in the ISBMR without surrendering their current appointments with their mother units.

Alas, the physical facility given to ISBMR, a historical icon of a building, the former Bureau of Soil of the defunct National Science Development Board (NSDB), was woefully inadequate for its research needs. Hence, physical integration was impossible. Even if it were possible, the resistance put up against the move by the already existing institutes and research laboratories assured that a bloody conflict with no victor in the end will occur.

Events moved on anyway such that in 1999, under the Presidency of Dr. Emil Javier and Chancellorship of Dr. Perla Dizon-Santos Ocampo, Republic Act 8503, known as the "Health Research and Development Act of 1998", established the National

Institutes of Health which took over the ISBMR, lock, stock, and barrel.

Thus, as I said in the beginning, considering this biography, NIH is 28 years old, since NIH grew out of the ISBMR in the 9th year of the latter's existence.

The NIH law enumerated five (5) objectives of the Institutes in Section 4. I would like to single Section 4e to close this short biography. Section 4e states as an objective of NIH. "To ensure that the results of health research and development activities are utilized to improve the health of the people." That precisely is the reason why there is a Socio in ISBMR because it is the social sciences that will move people into action when the scientific argument is won by the biomedical scientists.

In order to achieve Section 4e of the NIH charter, the theme

> Gone are the days when scientists have to work in an abandoned barn or garage. That notion is romantic but anachronistic.

of your celebration must be put in place. The question to be answered is: What does it take to empower the scientist in nation-building? I dare not claim that I know all the answers, not even most of the answers, but I can certainly identify three which I am confident are the foundations upon which the rest of the empowerment principles are anchored. In fact, I am prepared to call these three enabling requirements as primordial because these are the first among the many that may be suggested later.

The three primordial requirements I am proposing are the following:

1. Provision of the necessary tools of research

2. Supportive and enhancing research environment

3. Security for the scientist/ researcher

The necessary tools of research begin with the physical space, building if you will, where the scientist can work, wherein also is housed the equipment and apparatuses needed for his particular area of investigation. Gone are the days when scientists have to work in an abandoned barn or garage. That notion is romantic but anachronistic. In its present location and state, the NIH is limping its way into research because of the less than adequate tools of research. Its current home which, as I mentioned earlier, while of great historical value, is not designed for present day high technology research.

It is not the same as saying that no effort is being exerted by administration to remedy this deficiency. In fact, our

Dr. Domingo, with Chancellor Carmencita Padilla and Vice Chancellor Arlene Samaniego, welcomes UP President Alfredo Pascual during the NIH building groundbreaking in July 2016.

Chancellor has a big ticket project to address it. We are on the threshold of having a new and modern research building with state-of-the-art facilities. Once in place, we have answered the first of the 3 primordial requirements.

The second requirement is a supportive and enhancing environment for research. This is a mouthful and I dare not attempt to cover it comprehensively, assuming I can.

I will first touch on three specific items under this, items which always come up whenever I dialogue with our established and putative researchers in the Institutes. I must say that these issues, while existing during the time I was active in research, do not have the same gravity as they are now. The three concerns are (1) Ethical review of research proposals, (2) Technical review of the same, and (3) Protected time of the scientist/ investigator.

Let me start with the ethical review of research proposals by recounting a news item which reported that on February 1, 2016, the UK Human Fertilization and Embryology Authority (HFEA) issued a precedent-setting decision to ALLOW Scientist Kathy Niakan from the Francis Crick Institute in London to use the CRISPR–Cas9, a powerful tool that works like an editor for DNA, on viable human embryo only a year after the same group and ethicists expressed horror when the Chinese scientists did the same in human cell lines, not embryo. I think this simple news report capsulizes the problem with ethical review.

> The scientist must be able to live decently with the income he gets from being a researcher. The scientist must also have academic security just like the teacher.

The problem arises from one very simple phenomenon and that is, scientific discoveries leading to new knowledge and technologies that are begging to be applied for the ultimate purpose of improving the human condition, outpaces by many years/decades the ethical principles that may be applied to measure the ethical correctness of such application. Science and Technology always preceed the relevant ethical principles. I wonder if Dr. Saul Krugman, who injected inmates of an institution for mentally-challenged children heat-inactivated serum from Hepatitis B carrier persons in order to demonstrate the effectiveness of a putative vaccine against the virus, will get an ethical clearance to go ahead, applying present day ethical standards which were not in place at the time of the experiment. In such situations, jurisprudence offers us a solution, and that is, the judge should not add or subtract from what the law specifically provides.

In my own case, when we did the clinical studies on the hemodynamic pathophysiology of hepato-splenic Schistosomiasis Japonica, the procedure we used in the experiment may not pass present day review. But then, at that time, no alternative was available.

Likewise, in technical reviews, it should be sufficient for one or two authentic authorities on the subject to pass judgement on the merit of a proposal. Presenting it to a bigger group where some of the members cannot add anything of value to the evaluation may only unnecessarily prolong the evaluation process.

I suggest that the review process also look beyond the stated objectives of the research because it can happen that approval of the proposal will result in a bigger scientific benefit (though unintentional) than mere attainment of the objective.

As an example, I would like to relate a proposal submitted to the governing council of the Philippine Council for Health Research and Development (PCHRD) when I was a member of the council. The objective of the proposal was to develop a modality of treatment against breast cancer in women. The method uses an antibody homing in on the tumor by carrying lethal chemicals. Being very well-informed on this particular field of study, I told the principal investigator that their chance of achieving the objective in five years is nil. Of course, they didn't like my comment. Nevertheless, I recommended the approval of the project because the technical know-how that will be generated by the project will find valuable application in similar future research works. I was proved correct at the end of five years.

Other specifics for providing a supportive and enhancing environment for researchers include:

Provision of the necessary tools, a supportive and conducive environment, and security for the scientist

1. Time protection for researchers

2. Support from the institution for basic activities in the laboratory like housekeeping, clerical works, and technical maintenance of the equipment during the period in between grants

3. New paradigm in auditing and financial rules

4. Opportunities for continuing and regular interaction between and among researchers

I will not elaborate on them. They are self-explanatory. The third and last of the primordial requirements is security in the scientific career. Certainly, this is one of the most, if not the most, empowering practices for the researcher. By this, I include material and academic security.

The scientist must be able to live decently with the income he gets from being a researcher. How I wish to tackle this at this time but there should be another occasion to discuss this fully. The scientist must also have academic security just like the teacher. For example, his ascent in the academic ladder, that is promotion to a higher rank and tenure, must be based primarily on his scientific output rather than performance in non-related areas like teaching and academic administration. My last story illustrates the bridge connecting protecting the time and providing security to the scientist/researcher.

When I was chair of the Department of Medicine, I experimented on an arrangement to enhance the output of our researchers in the department. I selected five faculty members whose inclination was research. I instructed the teaching monitors to free them from teaching except when they expressly requested to be given lectures and preceptorships. I also freed them from administrative and extension service assignments. Furthermore, I instructed the academic promotion board to consider only their scientific output when academic promotion and tenure come up for review.

Lo and behold! All five faculty members became productive in terms of scientific publication while, at the same time, ascending the academic ladder. Unfortunately, this little experiment was not sufficient to radically change the past and current practice in the University where a faculty member is still expected to teach, do research, help in administration, and get involved in extension work.

In conclusion, to empower our scientists and researchers so that they will contribute to nation-building via scientific productivity, an institution like the NIH should provide the necessary policies and practices that assure that the scientists can do their work optimally. I have enumerated three from my perspective. No doubt, the institution can identify others or may even prescribe a different priority. Whatever, the important message is do not expect a jumbo jet to emerge from a junk shop.

Making significant, lasting IMPACT on PUBLIC HEALTH

Cynthia M. Villamor

NIH's researches are now becoming part of mainstream health care delivery not only in the highly urbanized areas but also in geographically isolated disadvantaged areas (GIDA). The reach of the technologies produced, the medicinal traits of selected plants and herbs, services available in NIH's institutes and research centers, as well as the institutional changes brought by the policies created from its works, testify to how UP Manila has paved the way for its transformative role in nation building.

When then UP Manila Chancellor Perla Santos Ocampo established the **National Institutes of Health (NIH)** on January 26, 1996, the old, antiquated building of the former Bureau of Science became its home. That time, research at the university was fragmented, uncoordinated, and poorly funded. Worse, it had no collective vision, with the other aspects of the environment not facilitative and supportive of research as a major undertaking of faculty and support personnel.

The administration of **Dr. Santos Ocampo** and later, **Dr. Alejandro de Leon** (1996-2000), set the vision, goals and niche of NIH, that is to be the Philippines' recognized authority in health research and development and the key source of critical health information for national development in the Philippines and Southeast Asia. "Science for Humanity, Scientists with Souls" became the mantra to emphasize that science should benefit the people.

With the signing into law of Republic Act 8503, the "Health Research and Development Act of 1998" on February 13, 1998, the NIH was established as the "coordinating and integrating body of existing researches in UP Manila." This act also provided for public access to research findings, facilities and other resources of the different institutes.







The previous NIH directors, top to bottom, from left, Dr. Perla Santos Ocampo, Dr. Alejandro de Leon, Dr. Mario Festin, Dr. Jaime Galvez-Tan, Dr. Lulu Bravo, Dr. Vicente Belizario, Jr. and Dr. Generoso Abes.

Vice Chancellor for Research and NIH Executive Director Eva Cutiongco Dela Paz addresses health researchers during an anniversary celebration of the Institute in 2015.

The NIH's first component units were the Institutes of Ophthalmology, Biotechnology and Molecular Biology, Clinical Epidemiology, Pharmaceutical Sciences, and Socio-Biomedical Research. The latter was the NIH precursor, having been established in 1988 as part of the reorganization of UP Manila to ensure that the results of health research and development activities are utilized to improve the people's health.

It also witnessed the early formative years of the Institute amid physical and organizational constraints, including the lack of support bodies and mechanisms to expedite research. As years went by, additional institutes were founded: the National Telehealth Center, and the Institutes of Child Health and Human Development, Human Genetics, and Health Policy and Development.

Under the helm of **Vice Chancellor for Research Dr. Mario Festin** from 2000-2002, the NIH faculty post was strengthened by ensuring protected time to do research, publish researches, train new researchers, and instituting a search program for nominees for scientific award giving bodies.

The years that followed were periods of strengthening the organization under the watch of **Dr. Jaime Galvez-Tan** (2002-2005) and **Dr. Lulu Bravo** (2005-2011). The former's administration embarked on a campaign to mobilize resources for research endeavors through ingenious tie-ups with other agencies that firmed up the reward for research publications. The Office of the Deputy Director was created during his term during which time the advocacy for the Philippine National Health Research System (PNHRS) was started.

Dr. Bravo's administration continued the system reenergizing with the institutionalization of ethics and inter-agency cooperation as the cornerstones of research. As a result, research was aligned with national health priorities and oversight boards were set up, such as the NIH Institutional Review Board, with ethics and technical review committees that were recognized by the World Health Organization (WHO)-supported Strategic Initiative for Developing Capacity in Ethical Review and Forum for Ethical Review Committees in Asia and the Western Pacific Region (FERCAP).

Moreover, the NIH Training Center for Health Research Ethics and Good Clinical Practice (TCHREGCP) was established to support the ethics and capacity building agenda of the PNHRSand its allied agencies. Eventually, UP Manila was tasked as its lead convenor. The Research Grants Administration Office (RGAO) was created to facilitate financial support for capacity building. A new institute, Institute of Herbal Medicine was created.

Through the leadership of **Dr. Vicente Belizario** followed by **Dr. Generoso Abes** (2011-2014), the functions of the various committees of the NIH were strengthened, among which were the University Research Executive Committee, Intellectual Property Office, RGAO, UP Manila Research Ethics Board, Institutional Biosafety Committee, UP Manila Institutional Animal Care and Use Committee, and Resource Generation and External Linkages.

It was during this time that the NIH TCHREGCP was set up to respond to the capacity needs of the country by providing trainings and courses that enhanced the researchers' expertise on the various aspects of research

work. Close to 4,000 health researchers were trained at the end of 2014.

NIH Now

In 2017, after almost two decades of existence marked by the above milestones and significant developments, the NIH is considered a driving force behind many advances that have been contributing to the health of Filipinos. It continues to serve its mandate to be a major resource center for health research and capacity-building and to develop outputs that serve as vital guideposts in shaping national programs and policies.

Since its birth, the breadth and scope of health research that the NIH envisioned is being undertaken: "basic, applied, policy, product and operation types, and the application and utilization of its research findings and conclusions." This thrust remains consistent with the country's vision of "Health for All."

With existing and additional institutes, NIH continues to enhance national efforts in health care delivery through research. Recent units created were the Institutes on Aging, Philippine National EarInstitute, Newborn Screening ReferenceCenter, and Newborn Hearing Screening Reference Center.

NIRPROMP Project Head Dr. Nelia Cortes-Maramba receives a check representing royalty payment for the commercialization of lagundi and sambong as cures for common ailments

Significant Contributions

Through its 10 institutes, 3 centers, more than 40 study groups and a network of researchers specializing in varied health and socio-biomedical fields, the NIH continues to generate technologies that guide and shape national health policies and programs.

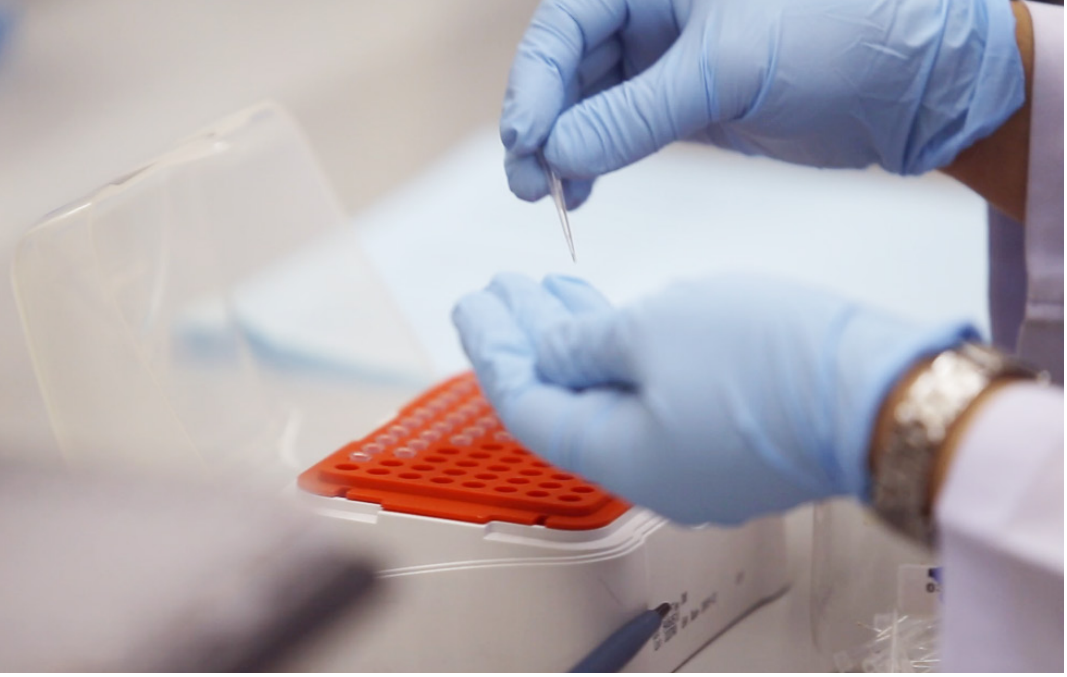
Vice-Chancellor for Research and NIH Executive Director Eva Cutiongco-Dela Paz said that among the benefits of NIH researches were their translation into products, national policies and programs, and their serving as inputs and basis for existing programs of the DOH, Department of Science and Technology, Department of Social Welfare and Development, and the Philippine Genome Center.

Dr. Raul Destura demonstrates use of Biotek-M Dengue kit.

From research to products

Some of NIH's milestone researches already translated into products include the herbal preparations for cough/colds and asthma (from *lagundi*), kidney stones (from *sambong*), abdominal colic and spasm (from *tsaang gubat*), and body pain (from *yerba buena*). The National Integrated Research Program on Medicinal Plants (NIMROMP) headed by Dr. Nelia Maramba pioneered the researches on medicinal plants that started in 1976 and which included studies on the above plants.

"UP Manila aims to further deepen its portfolio on natural/medical plant products (lagundi, sambong, tsaang gubat, etc) and build on medical device/technology innovations, such as the Dengue Diagnostic Kit, RxBox, and telemedicine," stated Chancellor Carmencita Padilla during an open forum.Studies on the properties of the DOH-recommended 10 medicinal plants are jointly conducted



by the NIH and DOH (please see separate article).

The Biotek-MTM Dengue aqua, a faster and cheaper diagnostic test for dengue with a higher specificity and sensitivity developed by a team of NIH researchers led by Dr. Raul Destura,is now on a national roll-out (please see separate article). In the pipeline are diagnostic kits for schistosomiasis, malaria, leptospirosis, filariais, and chikungunya.

Dr. Cutiongco Dela Paz said that one of the most anticipated projects is the Lab-in-a-Mug that integrates and miniaturizes in an isothermal unit as small as a muglife-saving diagnostics that are vital for better management of illnesses leading to higher survival rates and improved quality of life. Additional jobs are generated by the NIH researches through the dengue kit spin-off company, Manila Health Tek and the increasing commercialization of medicinal plants with a combined 48 licensees to date.

That the NIH is making headways in telehealth is proven by the adoption of the RxBox and other devices nationwide. The RxBox: Integrating Medical Devices in the National Telehealth Service Program (NTSP) demonstrates the integration of the National Telehealth Center's three major technologies under development – telemedicine and telemedicine device RxBox and the Community Health Information Tracking System (CHITS). To date, telemedicine has linked over 550 primary care physicians serving remote communities from Batanes to Tawi-Tawi to medical specialists from the Philippine General Hospital (PGH), Eastern Visayas Regional Medical Center and Baguio General Hospital and Medical Center. Telemedicine services have covered health disciplines, such as surgery, orthopedics, pediatrics, ENT, internal medicine, and maternal and child health. (*please refer to the UP Manila Health Ripples Issue on Telehealth, July-December 2015)*

From research to policies

NIH has contributed three vital laws that were products of long years of research. RA 9288, or the Newborn Screening Actof 2004 mandates the screening of Filipino newborns for genetic and metabolic disorders and management of confirmed cases. RA 9709, or the Universal Newborn Hearing Screening and Early Intervention Act stipulates the prevention, early screening, diagnosis and intervention using hearing amplification devices with speech rehabilitation to promote optimum language development.

As of this time, over 100,000 have been saved from possible death, mental retardation, and other harmful health outcomes of genetic and metabolic disorders through newborn screening. In 2015, the expanded newborn screening program was implemented. Babies can now be tested for more than 20 disorders from the original six.

The policy push on hearing screening and intervention is driven by the 1.38 per 1,000 Filipino children with bilateral severe to profound hearing loss. Studies at the PGH alone established the failed screening at 29% bilateral while very few babies were brought back for follow-up. At the Ear Institute, the average referral for diagnosis of hearing loss was at three years of age with only 30% referred at less than one year old.

A recent bill enacted in early 2016 through the NIH researches on orphan disorders was RA 10747, the Rare Disease Act of 2016. The law establishes and integrates comprehensive and sustainable medical care and access for patients with rare diseases to the public health system. Another bill to establish an integrated utilization and promotion of folic acid food fortification and supplementation has been filed in Congress.

National Telehealth Center's Arturo Ongkeko leads attendees to an exhibit of the programs, services, and technologies of the Center during its anniversary celebration.

From research to support for national health programs

NIH has conducted national surveys in support of DOH programs, such as the National Surveys on Blindness and Visual Disability, Intestinal Helminth Infections in Pre-school or School-age Children in the Philippines, National Oral Health Survey, Mental Health information Systems, Sin Tax Law, and Philippine Health Insurance. Such surveys provided baseline data that served as inputs for policy formulation, program planning, and projections in the case of sin tax and health insurance.

For eye diseases, two major screening programs, the National Vision Screening Program for Kindergarten Pupils (NVSPKP) and the screening of premature babies for Retinopathy of Prematurity aim to save Filipino children from permanent blindness. Blindness from ROP and amblyopia are part of the causes of blindness of an estimated 480,000 Filipinos of which a significant cases are preventable and treatable.

For recognizing the need to screen children for vision problems and developing a Vision Screening Kit as a tool to prevent blindness through early detection and treatment, the NVSPKP was conferred the 2017 Alberto G. Romualdez, Jr. Outstanding Health Research Award in the Health Services Research Category.

Currently being legislated is a National Vision Screening Act that stipulates mandatory screening of kindergarten pupils and two bills on the National Telehealth Act which were drafted and being finalized through data generated by NIH studies.

The NIH's pioneering research and advocacy work on telehealth led to the inclusion of eHealth in the DOH's National Objectives for Health and the National Unified Health Research Agenda for 2010-2016. They also paved the way for the creation of the National eHealth Steering Committee to oversee the alignment of all eHealth-related initiatives and projects in the country.

Contributor to nation building

As the Training Center for Health Research Ethics and Good Clinical Practice, the NIH provides training and courses that enhance researchers' capacity for research, including methodology and design, ethics, scientific writing, and research management. NIH translates the knowledge that it generates from its researches into new knowledge, technologies, products, services, and policies. They are all disseminated in the various fora to create more opportunities for their acquisition.

The evolution of NIH depicts a model of how an academic center like the University of the Philippines Manila reconfigures into an academic system. Frenk, Chen, Bhutta, et al. (2010) explained that such transitioning "extends the traditional discovery – career education continuum in schools and hospitals into primary care settings and communities, strengthened through external collaboration as part of more responsive and dynamic professional education systems."

The fruits of NIH's labor are now becoming part of the mainstream health care system delivery not only in the highly urbanized areas but also in geographically isolated developing areas. The reach of the technologies produced like the RxBox and CHITs, the medicinal and therapeutic traits of selected plants and herbs, services available in NIH's institutes and research centers, as well as the institutional changes brought by the policies created from its works, testify to how UP Manila's leadership has paved

the way for the transformative role of the university in nation building. The partnership that the university has built with local, regional, national, and international organizations form a responsive culture of inquiry that ensures sustainability of the generation of knowledge, technology, services, and policies for the 21st century.

New NIH building

By 2019, a modern 18-story NIH building will rise on a 4,000 sq meter lot with state-of-the art facilities and cutting-edge laboratories. There will be venues for collaboration with health industry partners and agencies, meeting and conference rooms, theater and audiovisual rooms, and learning nooks that will allow for greater interaction among researchers.

It will have a future National Center for Biosafety and Biosecurity, Clinical Research Center, and Animal Research Facility. With streamlined operations, a strong ethics and expanded grants administration, and an upcoming new building, the NIH is poised to expand and strengthen collaborations nationally and internationally to build sustainable solutions for the country's and the Filipinos' optimal health.

Reference:
Frenk J, Chen L, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Published online at www.thelancet.com (DOI:10.1016/S0140- 6736(10)61854-5) on Nov 29, and in The Lancet Dec 4, 2010, vol 376; pp 1923–58).

Institutes and Centers:

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- Institute of Molecular Biology and Biotechnology | Director: Dr. Edsel Maurice Salvana
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- Institute of Clinical Epidemiology | Director: Marissa M. Alejandria, MD, MSc, FPCP, FPSMID
  (02) 525.4098 • *http://nih.upm.edu.ph/institute/institute-clinical-epidemiology*
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- National Telehealth Center | Director: Dr. Raymond Francis Sarmiento
  (02) 509.1003 • *https://telehealth.ph*
- Newborn Hearing Screening Reference Center
  (02) 554.8400 loc. 2153 • *newbornhearingscreening.ph*
- Newborn Screening Reference Center | OIC: Riza Suarez
  (02) 522.4396 • *https://www.newbornscreening.ph/*
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Seeing the need for a more accessible and accurate option, Destura, as lead scientist, developed a dengue-diagnostic kit that harnesses the power of molecular-based technology minus the significant expense attached to it. Hence, the creation of Biotek-M™ Dengue aqua *– a commercialized, locally-developed technology that detects the presence of the fatal infection in the first 0 to 5 days of illness.*

1st Dengue Diagnostic Kit by UP Manila Scientists - FASTER, CHEAPER, and PROUDLY *PINOY*

Anne Marie D. Alto

Ms. Joy Ann Santos, Dr. Raul Destura, and Ms. Kristine Marie Flores-Destura with the Biotek-M™ Dengue aqua kit

Resolving the smallest to the grievous of the country's problems requires collective action from people who believe strongly that their common aspirations can transcend all kinds of barriers. This includes our scientists whose role is to take research a step further and explore uncharted territories rather than just putting them on paper.

Just ask Dr. Raul V. Destura – he and his team did just that.

Biotek-M™ Dengue *aqua* Kit

Dengue, a mosquito-borne disease, becomes most dangerous when not treated early; and one of the main reasons why it costs lives is prolonged detection of the virus. Data from the Dengue Disease Surveillance Report of the Department of Health show that a total of 58,598 dengue cases were reported nationwide in the first half of 2017, most of those cases belonged to children age 5 to 9 years old (Department of Health, 2017).

While the casualties mount, the burden of combating the disease is carried mostly by those in the marginalized sector who will have to shell out P4,000 to P7,000 to take the Polymerase Chain

Reaction (PCR) – the popular dengue detection method – or the NS1 Antigen that costs about P1,000 to P3,000. Yet these numbers are just the cost *per test*, it will still depend on how many tests are deemed necessary to confirm if the symptoms one suffers from are those of dengue fever or not.

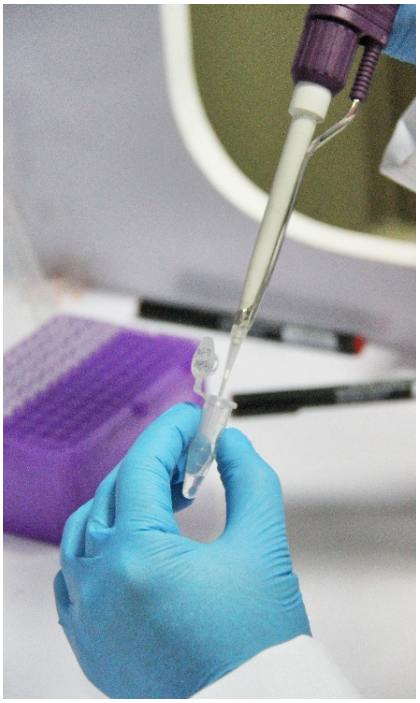
(ribonucleic acid) products with a simple heating device. It's simpler, easier, and cheaper than the standard molecular test the world enjoys," he said.

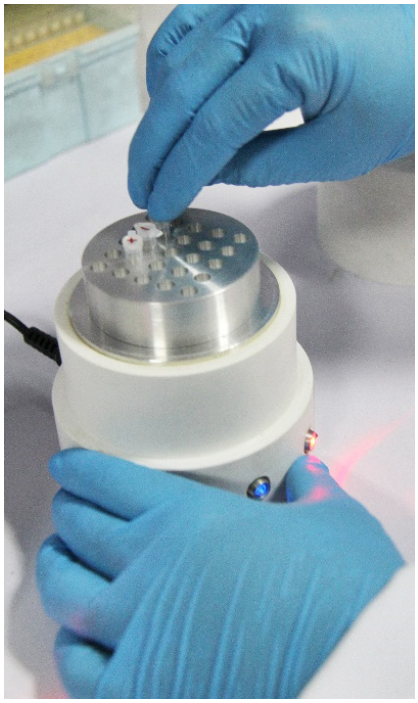
While NS1 Antigen and the PCR are the commonly used dengue-diagnostic tests in the country, both have their pros and cons in detection and accessibility.

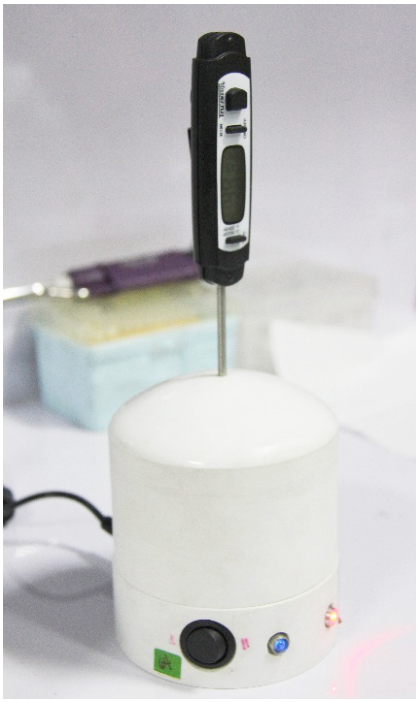
"NS1 picks up the disease in the first 0 to 5 days of illness. Unfortunately, the results of the test

inside the improvised heating tube made of PVC pipe, and are heated at the right temperature (63°C) until the thermometer indicates that the samples are ready.

In less than an hour, the vials will be transferred from the heating device to the LED transilluminator. Against the







(1) Nucleic acid extracted from the blood and transferred to a small vial. (2) Vials placed inside the improvised heating tube made of PVC pipe. (3) Samples heated at 63°C.

Seeing the need for a more accessible and accurate option, Destura, as lead scientist, developed a dengue-diagnostic kit that harnesses the power of molecular-based technology minus the significant expense attached to it. Hence, the creation of Biotek-M™ Dengue *aqua* – a commercialized, locally-developed technology that detects the presence of the fatal infection in the first 0 to 5 days of illness.

"Biotek-M™ is a molecular test that amplifies RNA

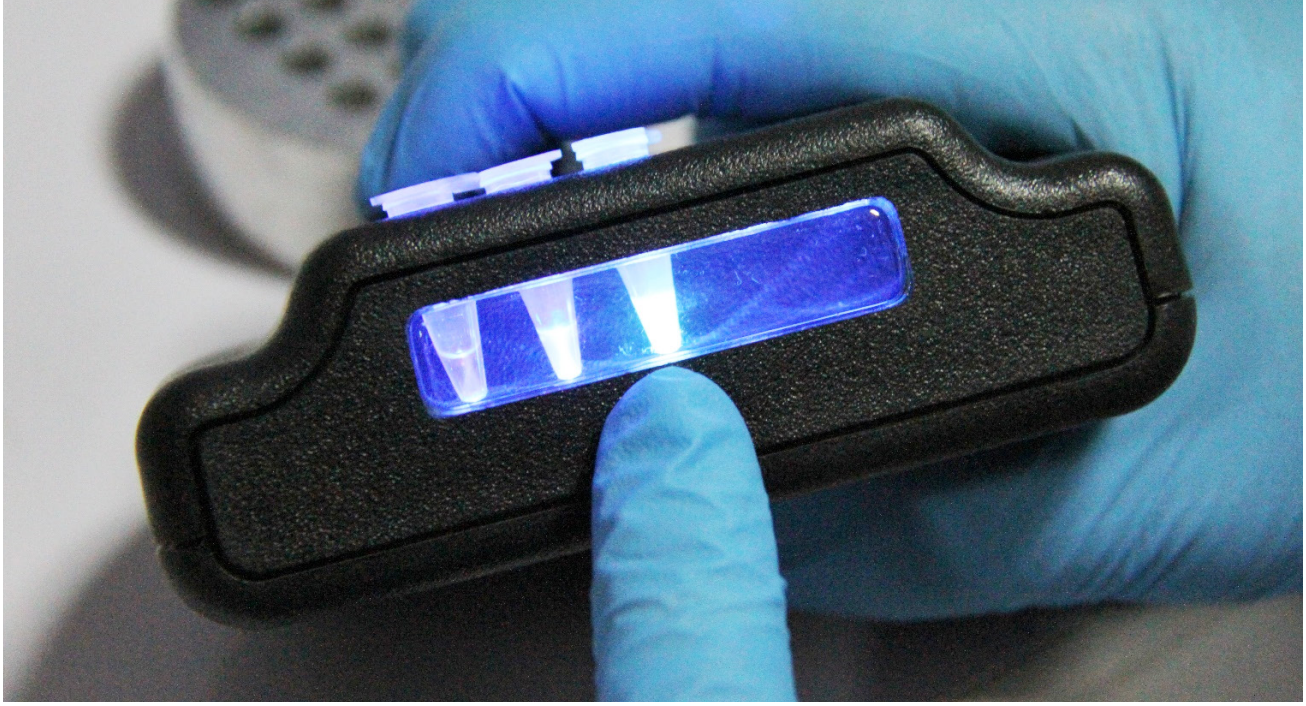
are affected by the immunological status of the patient. *Kung kailan nagiging* secondary dengue – *ito 'yung mas* severe *na ang* manifestation – *doon bumabagsak ang* sensitivity *pa lalo ng* NS1 to as low as 40%.

This means that the technology fails at that point when you need it the most. A molecular test like PCR similarly can pick it up. And it's really good! Sensitivity can go as high as 95%. Unfortunately, a powerful technology, but a very few can access them," Destura notes.

The Biotek-M™ costs only a third of the PCR test and half of the NS1 amounting to P700 to P1,500 per test. In addition, the kit is designed and operated in a very simple way. First, the nucleic acid is extracted from the blood and transferred to small vials. The vials are then placed securely

blue light, the samples will change into green if the blood is positive for dengue or will maintain its orange color if it is clear of the fatal disease.

Through Biotek-M™, doctors would make better decisions for their patients if they can confirm or rule out dengue the soonest possible time. Moreover, institutional units or hospitals would not have to admit every patient suspected of dengue. This would translate to better delivery of healthcare to the patients – the hospital would have fewer



Dengue-positive sample turned green against the custom-designed LED Transilluminator.

admissions, the staff will have more time to attend to other patients, and there will be more available resources to patients who need them the most.

Think of it this way: Biotek-M™ crosses three hurdles with one leap. It is accurate, time-saving, and low-cost Filipino-made technology that provides access to the marginalized sectors.

Lab-in-a-Mug Project: The Search for Grants

In 2010, Destura and seven other co-inventors composed of infectious diseases specialists, molecular biologists, and biotechnologists received a grant given to the Philippine Genome Center by the Department of Science and Technology's Technology Innovation for Commercialization and Technology Application and Promotion Institute, and the Philippine Council for Health Research and Development.

Having a shared goal of identifying a common and deadly virus at its early stage, Destura and his team have untangled a new method of detection that is within reach of the Filipino people, unlike the previous inventions.

The grant was implemented by the National Institutes of Molecular Biology and Biotechnology under the name Lab-in-a-Mug project.

According to Destura, all diagnostic kits in this project are integrated and miniaturized in an isothermal unit as small as a "mug" that will function as a multi-infectious disease diagnostic device similar to a portable laboratory. The "Lab-in-a-Mug" was also conceptualized, designed, and piloted at the Institute of Molecular Biology and Biotechnology, National Institutes of Health, University of the Philippines Manila with Destura as project leader. In the pipeline are testing kits for tuberculosis, salmonella, chikungunya, influenza, malaria, schistosomiasis, leptospirosis, Zika, and paragonimiasis, which already have their proof of concepts and will set off once funding is secured.

The grant enabled the team to conduct the study which they completed in almost two years from 2010 to 2012. Having a shared goal of identifying a common and deadly virus at its early stage, Destura and his team have untangled a new method of detection that is within reach of the Filipino people, unlike the previous inventions.

"First we identified a need for technology, then we discussed what the best platform technology is for this particular problem, and then we arrived with technology using isothermal amplification. After deciding what platform to use, the experimental methods were done for proof of concept. After finding the proof of concept that it is feasible, the laboratory performance testing assay on known standards and controls followed. When it passed

laboratory performance assay, we Identified the analytical sensitivity and specificity based on laboratory performance. After getting the number, we proceeded with clinical validation study to test it with actual patients needing it," Destura explained.

Completing the sample size was a major challenge to test the effectivity of the kit. The first trial required over 100 patients and the second consisted of more than 500 patients. Getting the consent of that magnitude of patients was another issue, considering that not everyone wants to be part of the study. The team got most of their patients from the National Children's Hospital, Philippine General Hospital, and the Medical City.

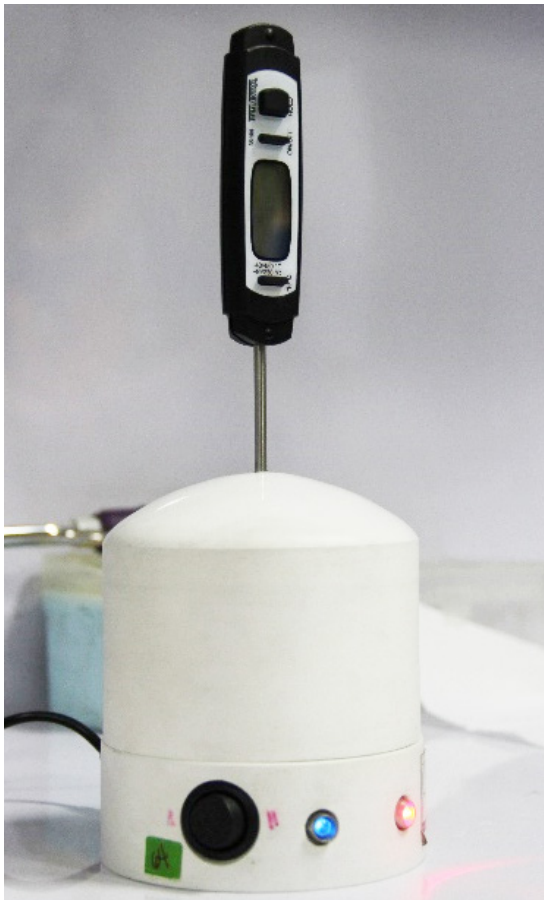
"We filed for Food and Drug Authority (FDA) approval and it is now an FDA-exempt technology, manufacturing site-approved, and commercial laboratory-approved."

Braving the Mainstream Market

Many factors contributed to the delay in using the kit; the supply chain being one of the major roadblocks. "The procurement process and the arrival of the reagents are a huge challenge while we're doing the clinical trial. Some kits arrived on time, some are near expiring. When you put them all together, it really affects the integrity of your kits."

In 2013, Destura and his team formed the Manila HealthTek Inc. to commercialize Biotek-M™ Dengue *aqua* kit and the rest of the Lab-in-a-Mug projects. "It's easier now that it's a spin-off company. All of the kits arrive much earlier and the performance is way better than the ones you tested in clinical trials. The clinical trial performance was already adequate for clinical use, the added performance power was a pleasant surprise to us."

The Manila HealthTek Office stands in Marikina where the kits are currently being mass-produced. But since the team initially developed the kit as part of a research and development program funded by several organizations, they had to secure their approval, apply for a license, and comply with regulatory processes before formally commercializing the kit.



The Biotek-M™ LAMP Heater Device

For three years, the company had to diversify its services to sustain their income while waiting for the rights to be granted. Finally in 2016, the rights to commercialize the technology was transferred to Manila HealthTek Inc.

"It needed a lot of capitalization. But it has entered the mainstream market which is the Department of Health. We are going into sectional discussions with the local government units and private hospitals to take in the technology," Destura added.

The Manila HealthTek is not limited to Biotek-M™. It is also dedicated to developing, manufacturing, and distributing technology for diagnostic medicine. They promise quality and accurate diagnosis of communicable and non-communicable diseases at a fraction of a cost.

Its Research and Development Division and Molecular Diagnostic Services Division help provide the necessary support to local and international scientists from designing the laboratory component of their research proposal to expanding their market reach.

Destura admits that credit for Biotek-M™ should not entirely go to him but his team of inventors. "They gave more than I expected them to do in terms of commitment [and] that meant a lot. I made them co-owners of the company Manila HealthTek Inc., this is also to send a message to other technology developers not to leave their associate researchers behind."

The Manila HealthTek Inc. office in Marikina City

From Laboratory to Business to Policy: A Translational Research

Aside from problems concerning design, laboratory performance assay, clinical validation, and marketing analysis, there's also the issue of scrounging for funds. Indeed, it has taken years for Biotek-M™ to fly off the ground but when it did, it achieved noteworthy success.

The Department of Health recognized this major advancement in dengue detection and made it into a policy to be the second confirmatory method of the Dengue Diagnostic Program.

"We became the second-line testing for Dengue. If NS1 turns out to be negative in its result, it will be re-tested using the Biotek-M™," Destura said.

Looking Ahead

Destura and the team are looking even further down the road for innovations even if the kit is still on the roll-out. He said that the drive to create innovations in healthcare delivery is fueled by one simple thing: love for country.

"Biotek-M™ is not about me. Biotek-M™ is for this country. That has been our inspiration in developing this technology. I certainly have grown so much from the experiences that the entire team has gone through. Things happen for a reason and it happens at the right time, given the right moment. If you are clear with your vision, what you want for yourself and for the country, then you just have to bite the bullet and stop making excuses for things that you cannot do because the only thing that stands in the way is you."

Every individual has a critical role in working on something great for this country. These scientists are willing to play their part in technology development, powerful enough to bring acceptable, accurate, and affordable healthcare within reach of the Filipinos.

Reference:
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The Biotek-M™ Dengue aqua inventors. Left to right: Sharie Keanne C. Ganchua, Joy Ann Petronio-Santos, Dr. Carmencita D. Padilla, Kristine Marie Flores-Destura, Dr. Raul V. Destura, and Dr. Jesus Emmanuel A.D. Sevilleja. Not in photo are Ricky B. Vinarao and Romel R. Gomez.

No Cold Feet: A Filipino Scientist's Journey

He dreams "for the Philippines to become the next biotechnology hub of Asia and for the Filipino scientists to be recognized as biotechnology developers that improve human health not just in the country but in the world."

January R. Kanindot

Blessing in Disguise

It was 2003, two years after 9/11 - an attack on American soil occurred that left one of the world's superpowers vulnerable. In its wake, the US modified some of its policies. Dr. Raul V. Destura, Raul as he is fondly called, had no idea of the magnanimity of the changes of this terror attack on him. He was an enthusiastic scientist on his first trip to the US. He was accepted to the International Training and Research in Emerging Infectious Diseases (ITREID) Research Fellowship Awarding the University of Virginia (UVA).

But, alas, upon his arrival, due to the change in policies, he was unable to secure a Social Security Number (SSN). In the US, without an SSN, it basically meant you are paralyzed. Raul was unable to access the money from his scholarship and receive pay for his work. He was forced to live in a government-subsidized apartment that was basically a shelter for the homeless. The only support he got was an allowance of Php10,000.00 his wife sent him monthly. He was stripped of everyday luxury and forced to live on hardly bare-minimum. Every day, he walked to the University as he could not afford fare. He told his wife that he had free food but to stave off hunger, he lived on a gallon of milk for breakfast, lunch, and dinner that cost him USD1.99. It was winter, he had to make do with layering his clothes as he could not afford to buy anything. It was a humbling experience for an established doctor but it was a dream he wanted to pursue so he kept moving forward despite all the daily struggles.

Dr. Raul V. Destura

> He could have endured more but sacrificing his family's safety and security was not part of the deal.

Until one day, he received a phone call from his brother. He asked Raul if he and his wife had a fight because when he asked her how she was, she broke down and revealed that they were about to lose their home. This hit him hard like the world came crashing down on him, all the while he thought he was protecting her but in fact, she was protecting him. He had been enduring everything for four long months because he felt that his pursuits were worth it, he could have endured more but sacrificing his family's safety and security was not part of the deal. He knew then what he had to do. He was going home.

Walking to his apartment in the freezing weather, he thought, perhaps this was God's way of telling him to stop. Maybe something else was in store for him. He was a little numb and he was sliding all over the place because he was wearing leather shoes, and in that frigid and desolate moment where his body was enveloped in cold and his heart was sinking over an impending inevitability came a woman's voice. He was momentarily yanked out of his solitary bleakness. An

Dr. Destura enjoying the company of his colleagues.

Asian looking lady was right in front of him. She must have noticed something was amiss. She offered him a ride back to his apartment. Later that day, the lady told Raul's plight to her group of Filipino friends, and he was invited to one of her friend's home and he was introduced to other Filipinos who later on helped him arrange his paper works. And the rest is history. Had it not been for that providential encounter, Raul would have gone home resigned to a different life. Today, the Asian looking lady named Thessa and another Filipina, Daisy who took him in to her home, became Raul's second family in Virginia. Over the years, they have witnessed one another's successes and sorrows.

Having a Dream and Starting Somewhere

Growing up, Raul was a curious child. He was always excited about what is out there in the world. He was never intimidated by the unknown. It was a constant nagging feeling in his head, of what ifs and what is. This particular curiosity has led him to take Microbiology at the University of Sto. Tomas. The facets of microbiology cemented his dream of becoming a scientist in molecular microbiology. However, his father suggested to take medicine, insisting that he will appreciate molecular science more if he became a doctor. His father was his role model, and as Raul puts it "it was for this weird paternal hypnotic reason" that he agreed.

To his dismay, medical school was a complete torture! He basically felt like lectures were a major cause of coma. He was impatient, uninspired and sadly full of excuses. He studied not out of love but out of fear of being kicked out. Years later, as it turned out, all hope was not lost because when he started his clinical clerkship, things began to change. His patients broke through his catatonic perceptions. He began to see his mission. He began to see his impact. His desire to change the health outcomes of impoverished people began.

Now, Raul has come a long way from being the detached boy. He has transformed himself into a man of purpose. Today, his drive is stronger than ever. He relates that "as a clinician–scientist, I continuously try to narrow down the gap among the Basic Sciences, Medical Sciences, Biotechnology and Community Service by forging strong collaboration among these disciplines to reach a focused goal. My research bench to community approach is ultimately geared towards developing low-cost technologies for the control of infectious diseases in the Philippines and the generation of new knowledge to find sustainable and equitable solutions to diseases of poverty."

He was never intimidated by the unknown. It was a constant nagging feeling in his head, of what ifs and what is.

Perhaps Raul was destined to a rollercoaster life as he has been met with setback after setback but

he has managed to turn things around. His arduous experience in UVA has made him realize how lucky he was to be chosen, to be in the presence of select fellows from different countries (China, Ethiopia, Brazil, Japan, and US). He vividly remembers their first laboratory meeting, his colleagues were talking about apoptopic pathways, cell-signalling mechanisms, migration and proliferation of epithelial tissues, genotyping, ribotyping. He just quietly nodded at them pretending to understand the discussion but he was feverishly typing every word that came out of their mouths. He was in fact, as we put it in local street slang, "nosebleeding." A believer in independent learning, he spent the first three months in the university library reading and learning.

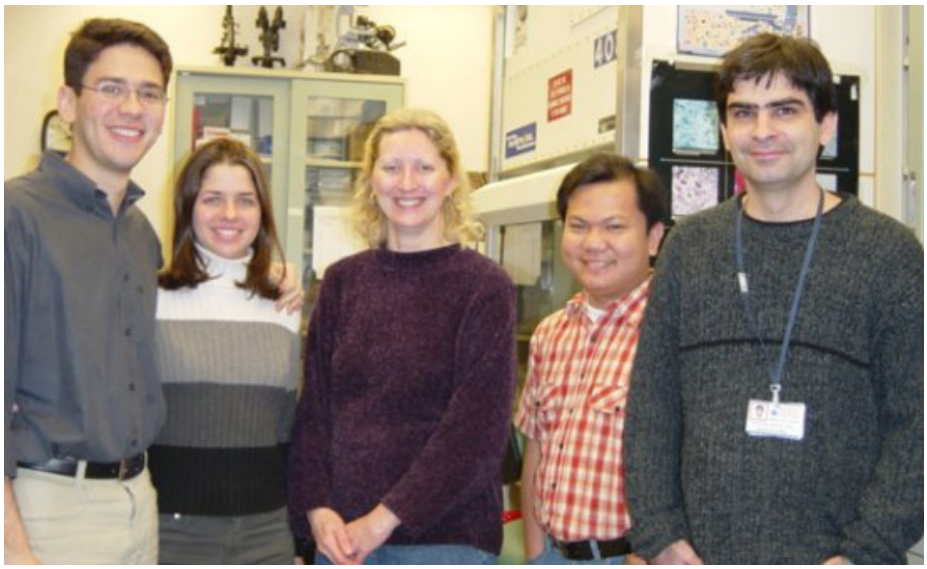
It finally dawned on him, that his father was right, being a physician helped him ask the right health-related questions and write appropriate research laboratory design. He ended up becoming a scientist-collaborator in a Biodefense program in UVA. He could have stayed in the US but all the access to first world technology made him realize that his life's meaning and purpose is back home where there were more than enough third world health problems that needed to be solved. In 2005, he decided to return home, this time around, for the right reasons.

That same year, he joined the University of the Philippines Manila - National Institutes of Health as a research faculty. In 2008, he became the Director of the National Institutes of Molecular Biology and Biotechnology of UP-NIH. The directorship gave him so much excitement. It sounded so glamorous! He was finally given a job where he had the authority and venue to put his skills and training to good use. But in keeping with the rollercoaster ride of Raul's life, he was met with an empty office, a disconnected phone-line, a busted air conditioning system and PhP 2,377.30 budget! It was disheartening to say the least.

He allowed himself to savour and bask in self-pity but only for about 30 minutes. He then had a Eureka moment. What can he do with 2,377.30 pesos? Well of course, he could buy bond papers for his upcoming task of writing proposals. Tons of proposals to every funding agency he could think of. He had his office phone reinstalled so he could sell his "larger than life" institute to his colleagues abroad. Php2, 3770.30 bond papers later, he got his first break for a small proof of concept grant that started the ball rolling and the rest, yet again, is history.

Today, the institute has seven research faculties, three are returning scientists, 17 research staff, over 100 mentored students, 10 visiting scientists, over 50 scientific papers, book chapters, abstracts and modules, 7 patent applications, and houses one of the most advanced molecular facility in the country. It has over PhP300,000,000 (USD ~ 6M) research grants so far. All generated by himself and his research faculties. Proof that blank piece of paper can go a very long way with the right dedication, determination and persistence.

To further his dreams, Raul proudly transferred the wheel of the institute to another brilliant returning Filipino scientist as he pursues in bringing his research outputs all the way to the marginalized sector by creating the first university biotechnology spin-off company of the University of the Philippines, the Manila HeathTek Inc. Its current flagship product is the Biotek-MTM Dengue aqua kit. (Please see related article). The kit is a more affordable and equally reliable diagnostic tool for one of the country's health threats. When he and his team developed the kit, the intention was to bring it to the marginalized sector because the cost associated with molecular based technology was only accessible to the more affluent. Also, with the current set up of research



A younger Dr. Destura with his colleagues from the University of Virginia.

in the Philippines where red tape and check and balance sometimes prevent a research project to take off, he had to do something to make his kit a reality. He ended up taking Masters in Business administration at the Ateneo de Manila School of Business. From being a researcher, he also became an entrepreneur. He believes that this is a good path for researchers in this country. To have the knowledge and skills to transform a research work into an actual product that the Filipino people can actually use. Biotek-M™ is now in full swing production. He hopes that it will be available in more hospitals soon.

From being a researcher, he also became an entrepreneur. He believes that this is a good path for researchers in this country. To have the knowledge and skills to transform a research work into an actual product that the Filipino people can actually use.

Time is of the Essence

For him, a researcher's greatest commodity is time. Time to finish work, to do experimentation, write the paper, prepare things and, at the end of the day, the information generated may not be satisfactory. And a researcher must finish his work because other researchers in countries with better resources may be doing the same and beat him to his game. That being said, Raul is not all work and no play. He admits that he needs to improve his time management skills and learn to say no to certain circumstances. In his free time he likes to spend it with his wife, Ning and two kids Niko and Miggy. He concedes that while he has sacrificed so much in the pursuit of knowledge, his sacrifice pales in comparison to the daily sacrifices of his wife to support him in all his endeavors. He is grateful that she has stood by him in all the rollercoaster rides of his life. To remain sane, Raul, likes to destress himself by singing and painting.

His Life's Legacy

This soft spoken man could go on and on talking about his passions in animated and earnest candor. His positivity is infectious that no matter how serious the topic, he never forgets to smile. There is no doubt that his joyful and persistent

Dr. Destura jams with UP President Alfredo Pascual during a testimonial tendered by UP Manila.

demeanor has carried him through all the frightful challenges he has had in his life. In his presence, he has a certain way of making you feel at ease and his humility is pervading that you forget that you are talking to a very accomplished scientist: The Medical City Physician Innovator in 2006; Outstanding Young Scientist of the Philippines in 2008; UP's Research Productivity Awardee in 2011; one of the Top 20 Young Physician Leaders of the World in 2011 given by the Inter-academy Medical Panel in Berlin, Germany; and The Ten Outstanding Young Men (TOYM) of the Philippines in 2011. In 2015 he received 2 national awards and 2 recognitions from the universities he studied from namely, the Dr. Jose P. Rizal, National Awardee in Research, from Philippine Medical Association and Dr. Eusebio Y. Garcia Awardee in Molecular Biology and Molecular Pathology, National Research Council of the Philippines; the Outstanding Alumni in Medical Sciences, De La Salle University, Manila Philippines; the Outstanding Alumni in Medical Microbiology, University of Sto. Tomas, Manila Philippines. In 2016, his Biotek-M™ Dengue kit was given Gregorio Zara Outstanding Technology Commercialization Award by the National Academy of Science and Technology and recently, his peers from the medical community recognized him as the 2017 Philippine College of Physicians Exemplar

Dr. Destura with his wife, Ning, and sons Niko and Miggy.

Distinguished Researcher Awardee. He believes that receiving an award is not just to boost once ego but to be a source of inspiration of one's life work.

He is not only respected but is also well loved by his colleagues, staff and mentees. His generosity is reputable. While he admits that research is financially challenging, he would be the first to shell out his personal money for the love of science. Co-inventor of the Biotek-MTM Dengue aqua kit, Joy Petronio shares that "He is a mentor that knows his craft but will allow you to do your thing. I mean, he will not impose his ideas but will encourage you to think also. He is open to suggestions and/or comments. He knows how to appreciate people working for him and with him. He is not selfish and will support your endeavor even if it means leaving the institute for greener pasture. It is not difficult to ask help from him. Sometimes, he tends to say yes to almost everyone that tend to use up all his time. He was the one who inspired me to do great in what I love to do. He would tell us (especially during my first few years at NIMBB) that our research is nothing if it will not translate into something that will benefit the people, especially the less privileged ones." He relates that if he could have it, his greatest legacy would be "for the Philippines to become the next biotechnology hub of Asia; for the Filipino scientists to be recognized as biotechnology developers that improve human health not just in the country but the world. That for those who will follow this path, I am so excited to know and to learn that they will surpass all the things that I have done. So, in the end, when you talk about legacy is when I am walking around the streets somewhere or in a health care center, seeing the technology helping marginalized individualsor all persons using your technology because they can afford it. Then that completes the story of me being a scientist."

This envisioned legacy is captured in what Raul wrote in the glass wall at the second floor of the Manila HealthTek office: "Everything that starts here is for the country."

"There will be a time when one's mind cannot formulate new synthetic medicine, but God is always there and His creation and the active principles created by God will be the ones to save mankind." - Dr. Nelia Cortes-Maramba

The researchers and staff of the Institute of Herbal Medicine, with other participants at the first Herbal Medicine Summit.

Herbal Medicine: FINDING its NICHE in PHILIPPINE HEALTH

Charmaine A. Lingdas

Once accorded lukewarm response due to the overwhelming acceptance of modern medicine, the field of herbal medicine in the Philippines today is finding its rightful place in the medical and scientific community. This is largely attributed to the seeds sown by the early believers and pioneers of medicinal plants whose story of hard work, perseverance, dedication, and competence in their researches fuelled in others after them the desire to continue what they had started in the hope of providing cheaper, safe, and effective cures for common ailments.

Long before research on herbal medicine was institutionalized at UP Manila through the creation of the Institute of Herbal Medicine under the National Institutes of Health, the National Integrated Research Program on Medicinal Plants (NIRPROMP) had been undertaking researches on several medicinal plants for over 30 years.

NIRPROMP as pioneer of medicinal plant research

Founded in 1974, with Dr. Conrado Dayrit, Professor and former Chair of Pharmacology at the University of the Philippines College of Medicine (UPCM) as Program Coordinator, and Principal Clinical Investigator **Dr. Nelia P. Cortes-Maramba**, NIRPROMP was established with the encouragement and

guidance of **Dr. Florentino Herrera Jr.**, together with other researchers, namely **Dr. Natividad F. de Castro**, **Dr. Horacio R. Estrada**, National Scientist **Clara Y. Lim-Sylianco**, **Prof. Ernesta G. Quintana**, **Dr. Romeo F. Quijano**, **Dr. Cecilia Vargas Zamora,** and **Jerry D. Saludez**. NIRPROMP created an integrated multi-disciplinary team dedicated to investigating the potential use and benefits of herbal medicines.

"In the beginning, there was not much acceptance by the medical community of herbal medicines," narrated Institute of Herbal Medicine (IHM) Director Dr. Cecilia Maramba-Lazarte.

Dr. Maramba-Lazarte recounted that "back then some doctors questioned the need to study herbal products when there were so many drugs available in the market." A daughter of Dr. Nelia Maramba, also known as the "Mother of Philippine Herbal Medicine," Dr. Lazarte recalled that in one of the presentations of her mother's research proposal, a doctor came to her and mockingly placed a white handkerchief on her head, imitating a fictional character, *"Mang Kepweng." Mang Kepweng,* who had mysterious healing powers, was popularized in the 1970s representing the traditional Filipino folk healers or *albularyos*. Undeterred, Dr. Maramba responded, "I am proud to be Mang Kepweng."

"Back then, they didn't understand that the real motive behind it is to have low-cost medicine," she explained.

NIRPROMP's mandate is to develop inexpensive herbal medicines for the poor, propagate the use of herbal preparations with proven medicinal safety and efficacy and identify scientifically validated medicines that would provide products for the Filipino pharmaceutical industry. It aimed to address the rising costs of imported pharmaceutical products and prioritize the reduction of the country's dependence on imports and offering of more affordable pharmaceutical products through locally developed herbal medicines.

From 1977 to 1982, NIRPROMP's work started by surveying more than 1700 herbolaryos (herbalist folk healers) on plants used for specific indications and any side effects caused. Out of the 1,500 plants identified, NIRPROMP scientifically validated that 480 of them contained beneficial medicinal properties.

From NIRPROMP to IHM

On March 29, 2007, the Board of Regents established the Institute of Herbal Medicine (IHM) as a component institute of NIH. NIRPROMP was integrated into the IHM as one of the study groups and is still headed by Dr. Nelia Maramba. NIRPROMP's numerous successes after more than three decades are now being built upon by the IHM in fulfilling its mandate.

Today, the IHM is recognized as a leading institute in facilitating research dedicated to herbal medicine in the country. Its multidisciplinary team is composed of experts in the field of agriculture, chemistry, pharmacology, and medicine. Its agricultural unit provides raw materials for the preclinical and clinical trials and research on the proper propagation and cultivation of medicinal plants. Its chemistry unit is responsible for mutagenicity/clastogenicity studies and isolation of active compounds. The pharmacy unit is focused on plant material processing,

The mother and daughter team of Dr. Nelia Cortes-Maramba and Dr. Cecilia Maramba-Lazarte, champions of medicinal plants.

Dr. Nelia Cortes-Maramba (seated, center) with former UPM Chancellor Manuel Agulto and a Pascual Laboratories representative, with other NIRPROMP members, during the signing of the agreement for lagundi and sambong.

formulation, and quality control. The field of basic and clinical pharmacology is responsible for the pre-clinical and phase 1, 2, and 3 clinical trials.

"The objective of IHM is to undertake scientific, ethical, and culturally sensitive research in an integrated and multidisciplinary approach to produce safe, efficacious, and more importantly low-cost herbal medicines."

IHM aims to undertake scientific, ethical, and culturally sensitive research in an integrated and multidisciplinary approach to produce safe, efficacious, and more importantly low-cost herbal medicines.

Back to Folkloric Herbal Medicine

Why focus on herbal medicines? Maramba-Lazarte stated that a lot of our modern-day products came from various plant sources. Research in herbal medicines, according to her, usually takes 5 to 6 years compared to the study of conventional synthetic medicines that usually takes 10 to 15 years.

"You have to go back to the *herbolaryos* (herbalist folk healers), to the traditional medicine healers and do an ethnographic study before proceeding to the actual research," she stated while explaining the indications on determining what plants are effective, a kind of study called *Reverse Pharmacology*.

When the NIRPROMP research team realized that over 500 projects were done before which were related to isolating active ingredients in plants but none of which had been successfully commercialized, they found out that one of the reasons was consumer distrust on unknown plant sources. However, many consumers trust herbolaryos and subsequently, the research team shifted to collecting folkloric data and conducting scientific tests to validate the herbolaryos' claims.

With the efforts of the researchers of the IHM to document the traditional healing knowledge of different herbolaryos among the indigenous peoples and other cultural communities in the country and to protect indigenous peoples' claim to their cultural heritage, IHM developed the Philippine Traditional Knowledge Digital Library on Health (TKDL-Health). The project is headed by former IHM Director Dr. Isidro C. Sia. To date, there is information on 13,900 medicinal plants from all over the country.

The Department of Health (DOH) Philippine Institute of Traditional and Alternative Health Care (PITAHC) and the Department of Science and Technology (DOST) Philippine Council for Health Research and Development (PCHRD) are the two funding sources for the research of the IHM. "PCHRD and PITAHC provides funds for herbal medicine research and work together to avoid duplication of research projects."

"The NIH Institute of Herbal Medicine is one of the many

institutions that are active in herbal medicine research in the country. As a national university, our mandate is not only focused on UP Manila but for all institutions and universities in terms of research and development," Sia emphasized.

Sia discussed that there are institutions and universities identified by PCHRD as Tuklas Lunas Centers, which are provided enough funding and is hoped to imitate what IHM has achieved in doing herbal medical research. "UP Manila NIH-IHM is not included as Tuklas Lunas Center, because IHM is the forefather of Tuklas Lunas Centers, through the NIRPROMP," he asserted.

Sia affirmed that one of NIRPROMP's achievement was its research in the ten medicinal plants that is endorsed by the Department of Health. These plants, Sia emphasized are "*lagundi* for cough, *sambong* for kidney stone, *tsaang gubat* for colic, *yerba buena* for pain, *akapulko* for skin fungal infection, *bayabas* for antiseptic, *niyog-niyugan* for worms, *ampalaya* for adjunct treatment of diabetes, *bawang* as adjunct therapy for hypercholesterolemia, *pansit-pansitan* or *ulasimang bato* for uric acid."

Some of the commercial brands of lagundi and sambong

Lagundi *(Vitex negundo L.)* and Other Herbal Breakthroughs

The development of modern lagundi-based medicine was the result of the herbal medicine research and development undertaken by NIRPROMP Researchers under Dr. Maramba with the additional research reports of Dr. Fabian M. Dayrit on the active principles of lagundi leaves. In 1994, researchers successfully developed a lagundi-based cough medicine in tablet form and in 1999, researchers successfully modified the formulation of lagundi cough tablets into a lagundi cough syrup.

Lagundi or five-leaf chaste tree is an herbal medicine used for the relief of nonbacterial cough due to the common cold, flu and mild to moderate acute bronchitis and for or relief of reversible mild to moderate bronchospasm with obstructive airway disease, such as asthma and chronic bronchitis. Available formulation includes 300mg/tablet and 600mg/tablet for adults, and 300mg/5mL syrup and 600mg/5mL syrup for children.

"The clinical trials of lagundi showed that that the medicine decreased the frequency of cough by the third day and improved the ease of expectorations and disappearance of phlegm for adults and pediatric patients with mild to moderate cough, it," affirmed Maramba-Lazarte.

Because NIRPROMP's research was funded by the Department of Science and Technology-Philippine Council for Health Research and Development (DOST-PCHRD), all intellectual property (IP) rights were managed and owned by DOST and NIRPROMP before. In 1999, DOST applied for a utility model with the Intellectual Property Office of the Philippines that was approved and issued in February 2001. In 2009, according to Republic Act 10055, otherwise known as the "Philippine Technology Transfer Act of 2009," technology developed backed by government funding must be completely transferred to entities, such as universities or companies that can translate this technology into useful products and services. Based on this new policy, PCHRD formally transferred the lagundi cough medicine syrup formula to UP Manila, which was then tasked with further research and development (R & D) work, licensing, and commercialization activities.

When lagundi cough medicine was first launched in the market in 1994, it faced an uphill battle of consumer skepticism. However, through concerted efforts to improve the image of herbal medicines, the drug has been a success for many companies. At present, lagundi is licensed to 18 companies of which 13 are already in the market, with one company's Certificate of Product Registration (CPR) just approved, and four with CPR being processed. It is included in the Philippine National Drug Formulary (PNDF).

Lagundi was among the plants listed by the Philippine Department of Health in October 1995, a list of officially endorsed plants that exhibit effective natural medicinal properties with proven therapeutic value along with the nine other plants isolated through its earlier R&D. Lagundi has relieved countless individuals of cough of non-bacterial origin.

In 2015, sales of lagundi reached PhP 155 M with annual profits from one hectare of lagundi ranging from PhP 163,000-553,000. "Aside from

the health part, we also want to help our farmers so that they would have new cash crops, and also help the Philippine pharmaceutical industry," added Maramba-Lazarte. The successful commercialization of lagundi has also been beneficial for the many farmers that grow and sell the shrub to manufacturers.

Sambong (Blumea balsamifera L.) or Blumea camphor tablet is another IHM success in the research of herbal medicines. Sambong tablet is used as an anti-urolithiasis treatment in patients with urinary tract stones with normal kidney function and for diuresis. Its technology transfer was completed in 1998. It is currently licensed to eight companies and included in the Philippine National Drug Formulary.

"At present, it is the market leader in anti-urolithiasis medicine in the Philippines" declared Dr. Maramba-Lazarte. She added that "sambong is heavily prescribed by nephrologists and urologists even at the National Kidney and Transplant Institute, that in 2015, sales of Sambong reached up to PhP 195M.

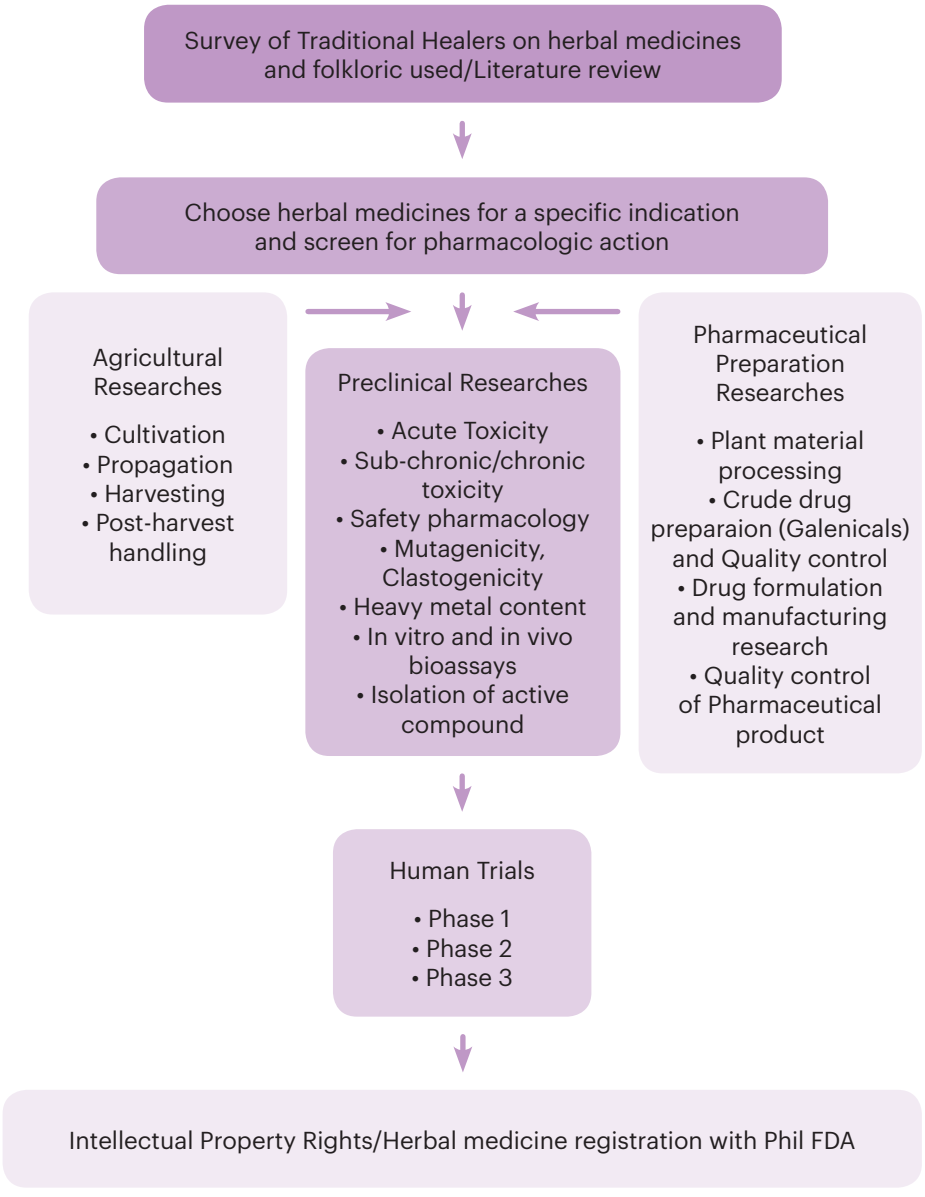
Other herbal medicines whose efficacy was researched and validated by IHM were *Akapulko* lotion, Yerba Buena tablet, *Tsaang gubat* tablet, and *Ampalaya* tablet. These herbal medicines will soon be available in the market and are still available for technology transfer to other pharmaceutical companies.

Akapulko (Cassia alata) lotion is for fungal infections caused by common dermatophytes; its effect is comparable to Sodium thiosulfate. Its technology transfer document was completed in 1996, for inclusion in the PNDF once the CPR is approved. Akapulko lotion is licensed to 2 companies, with CPR in process.

Yerba buena (Mentha cordifolia) tablet is used as an analgesic in patients with acute moderate to severe post-operative pain (post-dental, post-circumcision, post-episiotomy, post-tissue biopsy); its effect is comparable to paracetamol. Its technology transfer document was completed in 2002 and licensed to 1 company with its CPR in process.

Tsaang gubat (Carmona retusa) tablet is for gastrointestinal pain and biliary stone and biliary colic. In clinical trials, tsaang gubat tablet is comparable to dicycloverine. Its technology transfer document was completed in 2008 and is included in the Philippine National Drug Formulary. It is licensed to 2 companies with its CPR being processed.

Ampalaya (Momordica charantia Makiling variety) tablet is for treatment of non-insulin-dependent diabetes mellitus type II. Ampalaya tablet is comparable to glibenclamide in reducing fasting plasma glucose by week 3, and decreasing HbA1c. Its technology transfer document was completed



IHM Algorithm of Herbal Medicine Drug Development

in 2006. Clinical trials for the reformulation of tablets to more concentrated form will be carried out in 2018.

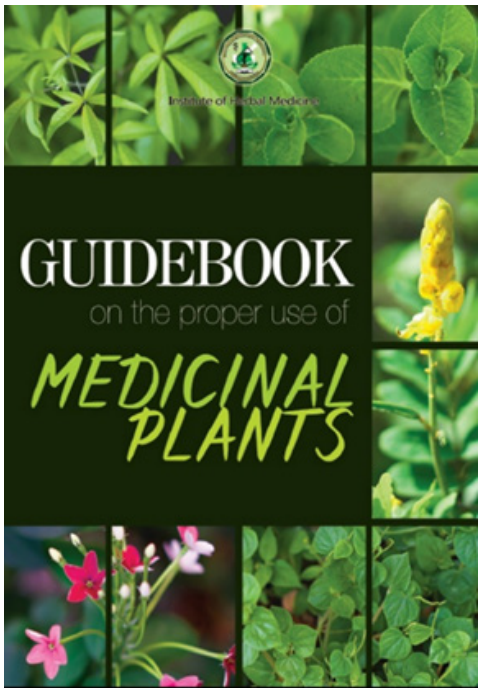
Merging of Science and Traditional Medicine

Maramba-Lazarte discussed the three categories of herbal products that are out on the market in the Philippines, namely herbal food supplements, traditionally used herbal products, and herbal medicines.

"When you register to the Food and Drug Administration (FDA) for herbal supplements and traditionally used herbal products, you don't need evidence of efficacy; you don't have to prove anything. You just have to show that it is safe," she explained why food supplements and traditionally used herbal products should put a label "No Approved Therapeutic Claims" and "The Traditional Application or Use Has Not Been Evaluated by the FDA."

"In herbal medicines, a whole lot of studies have to be done to be registered in FDA. It has to undergo pre-clinical trials, phases of human clinical trials," she asserted. "The drug development process is very similar to synthetic drugs. You need much more evidence to be registered as herbal medicine, and that is what we in the Institute of Herbal Medicine do."

Maramba-Lazarte pointed out that after it has been proven through research that herbal medicine is safe and effective, IHM will apply for patents to the Intellectual Property Office of the Philippines (IPO) and



The 6th edition of the guidebook

Why herbal medicines? A lot of our modern-day products came from various plant sources. Research in herbal medicines usually takes 5 to 6 years compared to the study of conventional synthetic medicines that usually takes 10 to 15 years.

offer the technology transfer document to pharmaceutical companies, which, in turn, will manufacture and distribute the herbal medicine to the market.

Other Achievements and Future Goals of IHM

Dr. Maramba-Lazarte said that "Last October 2016, we organized the first Herbal Medicine Summit." This 2017 we launched a book which contains the general principles of propagation and cultivation of medicinal plants, general principles for community formulations of medicinal plants, list of herbal medicines validated by the IHM, list of medicinal plants for common symptoms and diseases, and list of toxic plants and treatment for toxicity." The book is written in layman's terms and will be easily comprehended by any reader.

She announced that IHM has several projects going on this year and will be presenting to the PITAHC for funding several projects in line for next year. These include studies on herbal medicines as antibacterial agents, ointments, oral lozenges and as treatments for intestinal worms, amoeba, malaria, leptospirosis, and glaucoma.

In terms of collaboration, IHM is working on partnerships with international institutions and organizations for training and research. However, Dr. Maramba-Lazate still asserted that IHM research and patents should be maintained in the Philippines.

Maramba-Lazarte looks forward to more productive research. Sharing a quote that her mother, Dr. Maramba, lives by, "There will be a time when one's mind cannot formulate new synthetic medicine, but God is always there and his creation and the active principles created by God will be the one to save mankind," she asserted that IHM will continue to work for the advancement of herbal medicines in the country to provide Filipinos with cheaper but proven effective cures for common ailments.

The Philippine Health Information System-Mental Health Conditions: RAISING MENTAL HEALTH AWARENESS IN THE COUNTRY

Fedelynn M. Jemena

"Depression, for me, is like this: Imagine a full-colored picture of a park full of people enjoying themselves. It could be any picture you like. Just imagine it full-colored. The world is like that for me on most days. Then imagine that gorgeous colored picture suddenly dims to a pale gray, then a darker gray, then darker and darker until it turns black. It remains black for a while. Then a bright yellow doorway appears at the bottom right hand corner, like that NatGeo doorway? There's an EXIT sign on top of it. It's...It's not a way to get back to that full-colored world. It's a way out for me...I haven't considered that doorway for a long while, probably because I meditate, but I still see it. I know that I keep it at the back of my mind, just in case."

– A Non-trad Healer

Three years ago, the confession above would have earned that person an uncomfortable look, not to mention disbelief and strong derision. Those days are not gone yet, as there are still many Filipinos who view a mental illness or disorder like *depression* as an attempt to attract attention or just trying to act like a rich person (De Jesus, 2017).But those days are slowly diminishing—slowly, as in snail's pace.

But a snail's pace is better than no pace at all.

Members of the "Into the Light" Project (July 2014): [Front Row, L-R] Dr. Dinah Nadera (psychiatrist and President of Foundation Awit, an NGO); Mr. Jeffrey Go (Managing Director, Johnson & Johnson Philippines); Dr. Jacinto Blas Mantaring III (President, FACE, Inc.); Dr. Criselda Abesamis (Director IV for Special Concerns Technical Cluster of DOH ; Prof. Maria Lourdes Amarillo (UPM NIH-ICE); Dr. Benita Ponio (Executive Director, Metro Psych Facilities); and, Dr. Bernardino Vicente (National Center for Mental Health). Photo by: JA Bautista

On 2 May 2017, the Philippine Senate unanimously approved on 3rd and final reading Senate Bill 1354 or "The Mental Health Act of 2017" (Elemia, 2017). The principal author is Senate Majority Leader Vicente Sotto III, while the co-authors are Senators Loren Legarda, Antonio Trillanes IV, Paolo Benigno Aquino IV, Juan Edgardo Angara, and Joel Villanueva. It is sponsored by Senator Risa Hontiveros.

On 20 November 2017, the House of Representatives approved on final reading its own version, House Bill 6452 or *"Comprehensive Mental Health Act."* All 223 lawmakers voted in favor of it, with none voting against it or abstaining (Cupin, 2017). It is authored by 67 Representatives and sponsored by Congresswomen Angelina Tan and Cristina Roa-Puno, and Congressmen Romero Quimbo and Karlo Nograles.

Considering the contentious nature of the Philippine Legislature, this smooth sailing of a bill can be considered a miracle. The remaining work, before submission to the Office of the President of the Republic, is for the consolidation of the two bills by a conference committee and approval of this version by both Houses. On December 11, 2017, the Bicameral Conference Committee of Congress finished consolidating the two bills and will submit it for ratification. It is hoped that before 2017 ends, the Philippine Mental Health Bill will be ratified and signed into law by President Rodrigo Duterte. When that happens,

the Philippines, one of the few countries in the world still without a mental health policy, will have a lasting gift to its people.

These movements by the legislative branch of government are due to the push of many sectors of society: health professionals, patients and their families, artists and actors, ordinary citizens, students.

Just what is the Philippine Mental Health Bill?

Article 1, Section 2 of SB 1354 declares that "The State hereby affirms the basic right of all Filipinos to mental health as well as the fundamental rights of people who require mental health services."

The Bill ensures, among other things:

1. The delivery of an integrated mental health service to any Filipino who needs psychological care (better if you can cite the number of article or section),

2. Integration of mental health wellness programs in schools,

3. Establishment of community-based mental health facilities by local government units (LGUs),

4. Protection of the rights of the mentally ill as well as the rights of family members, caretakers, legal representatives, and mental health care professionals,

5. Creation of the Philippine Mental Health Commission as an attached agency of the Department of Health (DOH),

6. Tasking the Department of Health to craft a new national mental health program in coordination with stakeholders, and;

7. Appropriation of a 5% special budget from the Sin Tax collection for the initial implementation of the Law on top of the General Appropriations Act for 2017 and 2018.

Just why is a national mental health law important?

The World Health Organization (WHO) defines **health** as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (Principles). It defines **mental health** as "as a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community"(Fact Files: Mental Health).

What is a mental disorder? Can a person with a mental disorder still be a functional, contributing member of society?

GLOBAL SCHOOL-BASED STUDENT HEALTH SURVEY

PHILIPPINES, 2015	Students Aged 13-15 Years			Students Aged 16-17 Years			Students Aged 13-17 Years		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
Alcohol Use									
Percentage of students who currently drank alcohol (at least one drink of alcohol on at least one day during the 30 days before the survey)	18.2 (15.4-21.4)	20.0 (17.1-23.2)	16.6 (13.4-20.4)	29.7 (26.4-33.1)	36.6 (32.8-40.6)	22.6 (18.8-26.9)	21.1 (18.6-23.9)	24.4 (22.0-26.8)	18.1 (15.0-21.6)
Percentage of students who ever drank so much alcohol that they were really drunk one or more times during their life	16.5 (13.5-20.1)	18.6 (15.3-22.5)	14.4 (11.2-18.4)	31.5 (28.4-34.7)	36.8 (33.6-40.2)	26.1 (22.4-30.2)	20.3 (17.6-23.4)	23.4 (20.5-26.6)	17.4 (14.3-20.9)
Percentage of students who drank alcohol before age 14 years for the first time, among students who ever had a drink of alcohol other than a few sips	67.0 (63.1-70.6)	68.9 (64.6-72.9)	64.9 (59.8-69.6)	30.5 (24.6-37.1)	32.5 (26.8-38.7)	27.9 (20.4-36.9)	54.9 (49.6-60.1)	56.1 (51.1-61.0)	53.5 (46.7-60.1)
Dietary Behaviors									
Percentage of students who were underweight (<- 2SD from median for BMI by age and sex)	10.7 (9.2-12.5)	13.0 (10.6-15.8)	8.7 (7.1-10.6)	10.8 (8.6-13.5)	15.5 (12.1-19.6)	6.3 (4.5-8.8)	10.7 (9.3-12.4)	13.6 (11.3-16.3)	8.1 (6.8-9.6)

WHO defines **mental disorder (mental illness, mental disability)** as a health condition "generally characterized by some combination of abnormal thoughts, emotions, behaviour and relationships with others." Some are mild and cause only limited disturbance in daily life, while others are severe enough to need hospital care. Some examples are anxiety disorders, depression, bipolar affective disorder, schizophrenia and other psychoses, dementia, and developmental disorders like autism.

There are many causes of mental disorders: genes, life experiences (eg, from abuse, war, disaster), food deprivation or malnutrition, traumatic brain injury, exposure to viruses or toxic chemicals while pregnant, substance abuse (alcohol, illegal drugs), having a serious medical condition (MedlinePlus). Mental illness can happen to anyone.

Most mental disorders can be successfully treated as long as there is access to the right medical care and social services. **A person with a mental disorder can still be a functional, contributing member of society.**

What is the Philippine mental health situation?

Dr. Edgardo Juan L. Tolentino Jr (Past President, Philippine Psychiatric Association, January 2014 – January 2015) cited a 2006 study done by the DOH and the National Epidemiology Center: 32% of 327 government employees surveyed in the National Capital region suffer from mental disorders. These disorders are anxiety, phobia, substance abuse (alcohol), and depression. He said that these problems should not be dismissed. He also said that support of loved ones is very important (Surara, 2015).

A 2015 WHO Global School-based Student Health Survey of 8,761 students from Grades 7-9 and Year 4 reported that, for the Philippines:

• Students who seriously considered attempting suicide during the 12 months before the survey: 11.5% (13-15 years old [yo]), 11.9% (16-17 yo), overall 11.6% (13-17 yo);

• Students who attempted suicide one or more times during the 12 months before the survey: 17% (13-15 yo), 16.2% (16-17 yo), overall 16.8% (13-17 yo);

• Students who did not have any close friends: 4.2% (13-15 yo), 4.6% (16-17 yo), overall 4.3% (13-17 yo)

The Department of Health, in its *"National Objectives for Health Philippines 2005-2010" (2005)* book, cited the results of a disability survey done in 2000 by the National Statistics Office:

Mental illness was the third most common form of disability after visual, hearing impairments

2. The prevalence rate of mental illness in the country was 88 cases per 100,000 population,

3. Regions with the highest prevalence rate of mental illness were Southern Tagalog (132.9 cases/100,000 population), National Capital Region (130.8/100,000 population), and Central Luzon (88.2/100,000 population).

Enter evidence-based PHIS-MC

Convincing people to take mental health seriously takes a lot of hard work. Riddled with negative misinformation (e.g., that it is linked to insanity), hence, a taboo, having

mental illness was a shameful, painful subject for people to touch. The thick wall of denial raised by the sufferer, families, and friends made it hard to get proper medical assessment and treatment... as well as research data. Lack of significant research data means an incomplete mental health picture which can lead to low government priority for improvement in mental health facilities and personnel.

According to the 2007 *WHO-AIMS Report on Mental Health System in the Philippines:* "The country spends about 5% of the total health budget on mental health and substantial portions of it are spent on the operation and maintenance of mental hospitals. The new social insurance scheme covers mental disorders but is limited to acute inpatient care. Psychotropic medications are available in the mental health facilities. A Commission on Human Rights of the Philippines exists, however, human rights were reviewed only in some facilities and only a small percentage of mental health workers received training related to human rights. These measures need to be extended to all facilities."

To change the situation, a multisectoral group teamed up to produce the country's first integrated information system on mental health conditions. Known as the "Into the Light" Project or the Philippine Health Information System on Mental Conditions (PHIS-MC), it was launched on 22 July 2014.

The current PHIS-MC is a software which builds a database of information on mental health cases, especially schizophrenia for patients who consult the hospital. The doctors collect the data and, thereafter, anonymize and upload them to the data center. Some hospitals adopt the system for their electronic medical record. However, this does not mean that patient-doctor confidentiality is violated. It remains sacrosanct since data can be collected only with informed consent, while full access to the records remains between the patient and the doctor.

It was the outcome of a grant given in December 2013 by the Janssen Pharmaceutical Companies of Johnson and Johnson (Janssen Philippines) to the Foundation for the Advancement of Clinical Epidemiology, Inc. (FACE, Inc.) and the Institute of Clinical Epidemiology of the UP Manila National Institutes of Health (UPM NIH-ICE).

It was developed by a team composed of Technical Working Group of psychiatrists of the Philippine Psychiatric Association (PPA), UPM NIH-ICE, and FACE, Inc. The project head was Prof. Maria Lourdes Amarillo of UPM NIH-ICE.

PHIS-MC was rolled out among 10 government and four private hospitals in eight regions.

These hospitals were the Philippine General Hospital, National Center for Mental Health, Southern Philippines Medical Center, University of Santo Tomas Hospital, Mariveles Mental Hospital, Vicente Sotto Memorial Medical Center, Bicol Regional Hospital, Baguio General Hospital and Medical Center, Cavite Center for Mental Health, Veterans Memorial Medical Center, Western Visayas Medical Center, and Metro Psych Facilities in Pasig and Cebu (Janssen, 2014) (Dioquino, 2014).

The project ran for several months before its initial results of the pilot implementation were reported by Prof. Amarillo and Dr. Tomas Bautista (a consultant psychiatrist and clinical associate professor at the UP-PGH Department of Psychiatry & Behavioral Medicine or DPBM) in a multi-stakeholder forum held in Intramuros in June 2015.

Based on the uploaded records of 2,562 patients, 42% suffered from schizophrenia. Majority of these were men aged 20-44. Dr. Bautista said that, based on the figures, it can be estimated that roughly one million of the population suffer from schizoprenia.

Other findings were:
•15% of the patients had bipolar disorder, followed by 6% with substance abuse (drug addiction); the other patients suffered from major depressive disorder, anxiety disorder (panic attacks), schizoaffective disorder, acute

and transient disorder, and stimulant related disorder;

• Only 22% of the patients were covered by the Philippine Health Insurance Corp. either as members (13%) or dependents (9%);

• 29% said they have no PhilHealth coverage, while 49% did not indicate their PhilHealth status;

• Approximately 65% of the patients were between the ages of 22 and 44 years, according to Dr. Bautista, which is alarming as these are the productive years of anyone; and,

• 57% of the patients were males and 43% were females (Uy, 2015).

Also at the forum were some patients and their families who gave their testimonies. They emphasized the importance in patient recovery of continuous provision of medicines and family support group. Stigma also played a part in the health-seeking needs of some parents: to protect their loved ones (and, perhaps, the rest of the family as well), they chose private wards for their patients event if it meant paying very expensive fees.

Dr. Vicente Belizario Jr, then a DOH Undersecretary, found the initial results good, but not enough to convince the Department of Budget & Management (DBM) to allot a huge fund for the mental health program. He challenged the stakeholders to see the pilot study through to completion so that all may see the challenges, lessons, and best practices needed to ensure a successful system.

> "Convincing people to take mental health seriously takes a lot of hard work. Riddled with negative misinformation, having mental illness was a shameful, painful subject for people. The thick wall of denial raised by the sufferer, families, and friends made it hard to get proper medical assessment and treatment... as well as research data. Lack of significant research data means an incomplete mental health picture which can lead to low government priority for improvement in mental health facilities and personnel."

He also encouraged the people to conduct regular forums on the advocacy for the passage of a Mental Health Act (PNA, 2015).

Into the Light

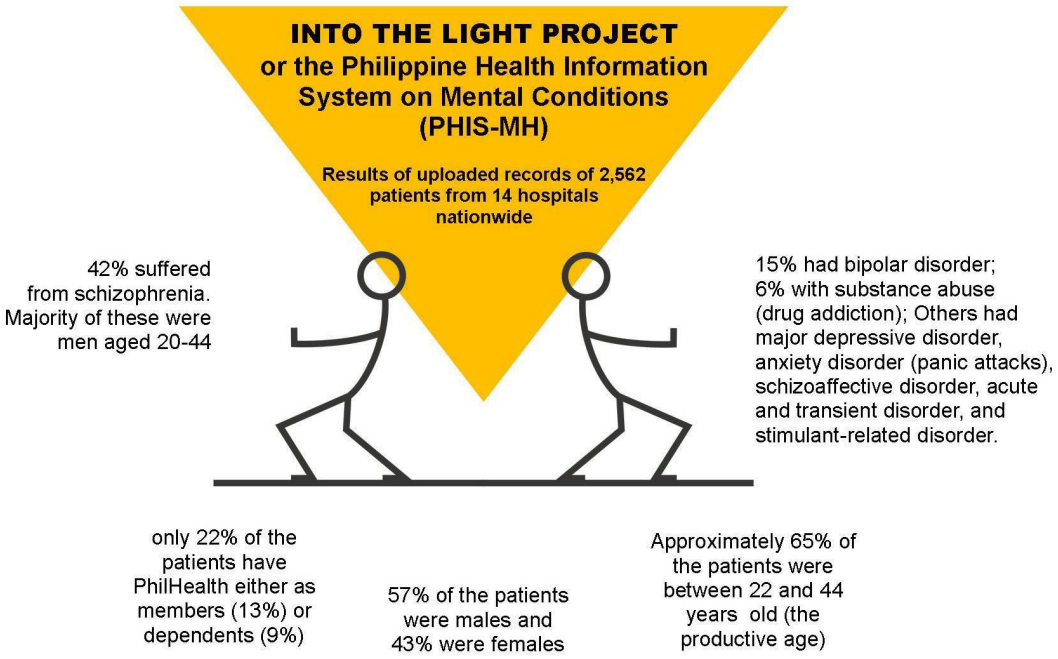
Unfortunately, just like a mental health patient seeking a cure and social acceptance, the PHIS-MH project hit a snag. In December 2016, the project died a natural death.

"It died because there was no more funding," said Dr. Tomas Bautista, a consultant psychiatrist and clinical associate professor at the UP-PGH Department of Psychiatry & Behavioral Medicine (DPBM). "All participating hospitals wanted to go on with the project, but...," he shrugged. They hoped that the DOH would offer to sponsor, but its National Center for Mental Health has its own version of the database to support.

Of the 14 hospitals, only PGH could continue with the PHIS-MH as its DPBM has some research funds to tap. "We're still going on: printing the 14-page Unified Clinical Intake Form (used per patient) and paying our own research assistant to encode data," said Dr. Bautista.

The PGH and NIH team know that the local data is rich enough for national policies to be based on, so it began other projects. "We were informed that Quezon City allotted funds for its own mental health program. We volunteered our expertise to do the training on this and the mhGap. The mhGap (Mental Health Gap Action Programme) is a tool formulated by WHO for community mental health. We trained the barangay health workers, nurses, and doctors on how to use this tool at the community level. In 2018, they will start encoding." Dr. Bautista said that city governments can approach DPBM for training.

"In another project, we partnered with Dr. Alvin Marcelo under eHealth as we wanted to expand PHIS-MH to the communities. It will be part of the Telehealth project." Another version of the project, much bigger as it will tap both hospitals and communities nationwide, was presented by the team and Dr. Marcelo to



Senator Risa Hontiveros. The senator promised to include it as part of the Implementing Rules and Regulations (IRR) of the Philippine Mental Health Bill.

Then, there are the researches. As of late 2016, two members of the PHIS-MH team, Dr. Bautista and Dr. Cynthia Leynes, completed writing the study presented to the multi-stakeholder forum in 2015. It is entitled, *"Clinical Presentations, Interventions and Outcomes of Schizophrenia in the Philippines: A Retrospective Review of Cases included in the Philippine Health Information System on Mental Health Conditions (PHIS-MH) prior to 31 December 2014."* The paper was submitted to the Philippine Psychiatric Association (PPA) for publication in its *Philippine Journal of Psychiatry (PJP)*. It will come out in January 2018.

The DPBM initiated a Psychosocial Wellness Program for UP Manila. The department is busy gathering data to identify the needs of the students and employees of the campus. The vision is to create a mental wellness program based on the gathered evidence. Some of the studies produced relied on the local PHIS-MC data, like profiling the patients from the different UP campuses, "Prevalence of depressive symptoms among 1st year college students (ages 15-18) of UP Manila," "Prevalence of non-suicidal self-injury and suicide attempts among young adult college students of UP Manila," and "PSWN has need to define mission, vision, goals and group objectives."

Six more researches came out in 2017, said Dr. Bautista. The latest paper submitted was on the prevalence of anxiety disorders and stress among UP Manila students.

As of December 2017, Dr. Anselmo Tronco, head of the DPBM's Psychosocial Wellness Program for UP Manila, is planning to talk with *Acta Medica Philippina* for a whole journal publication devoted only to the department's researches.

As a wake-upper, the results of the PHIS-HM certainly added its weight in the growing clamor for a national mental health bill.

The DOH, in October 2016, allotted more than PhP1B for it 2017 budget for the upgrading of its National Mental Health Program (signed in 2001 by then Secretary Manuel Dayrit as DOH Administrative Order No. 8) and facilities, and P100 million for its medicines access program for anti-psychotics or mental health drugs (ABS-CBN, 2017). The budget for the program was a big jump from P36-million in 2016 (Santos, 2016).

Among our legislators, several cited the results of the PHIS-HM when they filed their bills: Senator Pia Cayetano for her SB 2910 or "The Philippine Mental Health Act of 2015," House Representatives Leni Gerona Robredo (now the Vice President of the country), Romero Quimbo, Ibarra Gutierrez, Walden Bello, Karlo Alexei Nograles, Kaka Bag-ao, and Emmi de Jesus for House Bill No. 5347 (in support of Cayetano's SB 2910); and Senator Risa Hontiveros for SB 1190 or the "Mental Health Act of 2016." In November 2017, the House passed its own version. (To be fair, several bills were filed since the 1980s to help our people deal with mental health, but the push for their realization into law was slow until some just 'died' including SB 1946 or "Student Suicide Prevention Act of 2005" by Senator Miriam Defensor-Santiago (Rodriguez, 2015). Those early lawmakers included Sen. Orlando Mercado Jr and Sen. Joey Lina. (Among the current batch of lawmakers, Dr. Bautista cited Sen. Loren Legarda as the earliest to advocate for a mental health bill.)

The Philippine Psychiatric Association (PPA) launched in 2015 an online petition called "#MHActNow" at Change.Org aimed at urging legislators to pass the proposed mental health bill. It garnered 34,619 signatories.

Groups like the MentalHealthPH and Youth For Mental Health Coalition, Inc. along with the Philippine Mental Health Association or

PMHA provided support for people with mental disorders, raise the awareness of

Filipinos about mental health, reduce the stigma attached to it, and improve the MH situation in the country by lobbying for improved services and a national MH law. The two youth groups sprung up in 2016, while the veteran PMHA has been active since the 1950s.

Also in 2016, a mobile application called *PsychUP* was created by two UP Diliman computer science students for use by their fellow students. Described as a mental health first aid kit, the campus-based app was approved by the administration for a test run among UP Manila students. The app involved sending messages between a student and a guidance counseling peer. The anonymity of the student is guaranteed (De Leon, 2016).

In 2016, HOPELINE, a 24/7 crisis support hotline for suicide prevention and emotional crisis, was launched under the partnership of the DOH and the Natasha Goulbourn Foundation (NGF). Although a lauded move, netizens report that there are some problems with its implementation (Francisco, 2017). Hopeline, actually, already existed before 2016, but only under the aegis of NGF.

The shaking up of Philippine society when it comes to mental health will not halt anymore. Will the misunderstandings and the stigma surrounding it be gone next year? No, we're dealing

Mental health advocates: Actress Antoinette Taus, Miss International 2016 Kylie Verzosa, and "Be Healed Foundation" director Jerika Ejercito. Source: Alexa Villano/Rappler

with long-held prejudices here. It will take much time, patience, and work before they'll be gone from society, but they will be gone.

"It's truly the time to beat the stigma surrounding depression and other forms of mental illness. No one should have to go through depression alone... and it is now time, it's up to us to make sure that our countrymen get the help they need."

– Antoinette Taus, actress and mental health advocate

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Note: It wasn't smooth sailing. Prof. Amarillo said that, of the over 11,000 information sheets distributed to the participating facilities, only 9,066 (80%) were collected. Of these, 4,122 were encoded, but only 2,562 were uploaded into the system. She said the culprit was hospital wariness about sharing their records in the system.

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Balik Scientists Tungo sa Kalusugan at Kaunlaran

Prop. Josephine D. Agapito

Ang tema sa nasabing pagtitipon*
Balik scientists ay may pagkakataon
Bilang katuwang upang gamitin ang agham sa nasyon
Tungo sa pag-unlad ng kasalukuyan at sunod na henerasyon.

Dahil sa ibang bansa nag-aral at nagpakadalubhasa
Kaya Balik puso, Balik Pilipinas at Balik scientists nga
Upang magbahagi ng dunong at tulong sa bansa
Ang pagiging maka-Filipino ay tunay na maidadambana.

Nagsimula noong 1975 ang Balik Scientist Program
Naibalik sa DOST noong 1993 hanggang sa kasalukuyan
Isang hakbang dahil marami talaga ang nangingibang bayan
Nauubos ang mga siyentista at mananaliksik na sa pag unlad ay inaasahan.

Sa ilalim ng Department of Science and Technology
Binubuo ang programa ng Steering Committee
Ang PCAARRD; PCIERD at ang PCHRD
Na siyang nangungunang mga Council sa DOST.

Sinabi ng kalihim ng DOST na si Dr. Fortunato T. De La Pena
Tatlo ang ipinagdiriwang sa okasyon talaga
Para ito sa mga bumalik na siyentista
Na makakatulong sa bansa nang sobra.

Pangalawa ay para rin sa mga katuwang na institusyon
Sa kanilang taos pusong pagtulong
Kolehiyo, unibersidad; lokal na gobyerno ay naroon
NGO, pribadong sektor o industriyang nagbigay ng pagkakataon.

Suporta ng nasa lehislatura ang siyang pangatlo
Na naniniwalang mga siyentista ay dapat may mga insentibo
Maisulong ang House Bill 1204 at maaprubahan ng Kongreso
O ang Senate Bill No 1533 na maaprubahan naman ng Senado.

Kaya naman patuloy na mas pinalalakas ng DOST
Ang pagtanggap sa mga Balik Scientists syempre
Patuloy na lumalaki din ang bilang ng sumasali
Para siyensa, teknolohiya at inobasyon ay umunlad na mabuti.

Sa huli ay mas umaasa pa na madadagdagan
Ang mga siyentistang magbabahagi ng tulong sa bayan
Sila na naniniwala sa sama-samang pagtutulungan
Dahil ang agham ay para talaga sa ating mga mamamayan (Science for the People).

**Isinulat matapos ang nilahukang pagtitipon ng mga Balik Scientist noong Pebrero 2017*

Josephine D. Agapito
Guro sa Department of Biology, College of Arts and Sciences, UP Manila; host ng "Pinoy Scientist," programa sa DZEC tuwing Linggo, 5 pm at nagsusulat at bumibigkas ng mga tula tungkol sa agham, kalusugan, at ibang mahahalagang paksa