


Strengthening rural surgery in the Philippines: Essential in achieving universal health care

Brent A. G. Viray¹ | Crisostomo E. Arcilla Jr.¹ | Anthony R. Perez¹ |
 Jose R. Marfori² | Michael De Leon^{3,4} | Attaullah Ahmadi^{5,6}  |
 Don E. Lucero-Prisno III^{7,8}

¹Department of Surgery, University of the Philippines-Philippine General Hospital, Manila, Philippines

²University of the Philippines-Philippine General Hospital, Manila, Philippines

³School of Health and Related Research, The University of Sheffield, Sheffield, UK

⁴Institute of Public Health, Jagiellonian University Medical College, Krakow, Poland

⁵Medical Research Center, Kateb University, Kabul, Afghanistan

⁶École des hautes études en santé publique, Paris, France

⁷Department of Global Health and Development, London School of Hygiene and Tropical Medicine, London, UK

⁸Faculty of Management and Development Studies, University of the Philippines (Open University), Los Baños, Laguna, Philippines

Correspondence

Attaullah Ahmadi, Medical Research Center, Kateb University, Kabul, Afghanistan.
 Email: attaullah.ahmadi@kateb.edu.af

Abstract

The Lancet Commission on Global Surgery (LCoGS) launched Global Surgery 2030 to address the surgical services inequities with a bias toward low-income and middle-income countries like the Philippines. The same inequity is observed particularly when it comes to the urban-rural divide. With more than half of the population living in rural areas, access to surgery becomes a major challenge that further impedes the much-needed health of an economically productive workforce. The Universal Health Care [UHC] Act (RA 11332) of 2019 ensures that all Filipinos have access to quality, cost-effective, promotive, preventive, curative, rehabilitative, and palliative health services without causing a financial burden. Recognizing the provision of essential surgery, in the context of primary healthcare is important. It should be accessible, continuous, comprehensive, and coordinated at the time of need – parallel to the principle of primary health care. Driven by this concept and experiences, the authors conceptualized and presented the Philippine Rural Surgery model for future development and implementation. This is envisioned to provide essential surgery among local rural primary health care settings that is universal, accessible, cost-effective and safe. As this is still new in the Philippines, we proposed tenets and recommendations based on WHO Health System Strengthening building blocks to guide stakeholders in creating formal plans towards institutionalization under the principles of UHC. Such access to surgical service in the context of a unique socio-demography of the Philippines would be essential in attaining the parameters and provisions set by the UHC Act.

KEYWORDS

health policy, Philippines, rural surgery, universal health coverage

1 | INTRODUCTION

The Lancet Commission on Global Surgery (LCoGS) launched the Global Surgery 2030 (GS2030) to address the surgical services inequities with a bias toward the low- and middle-income countries (LMICs).¹ It was estimated that 2 billion people worldwide lack adequate access to surgical care largely concentrated in the LMICs where the poorest third of the world's population receives only 3.5% of surgical operations done worldwide.²⁻⁴ These surgical conditions comprise noncommunicable diseases and injuries accounting for about 11% of the global burden of the disease.^{5,6}

Recent estimates would account for the prevention of 1.5 million deaths per year or 6%–7% of all deaths in LMICs only if accessible essential surgical care was tended (e.g., obstructed labor, maternal hemorrhage, fractures, and acute abdominal disorders like appendicitis).⁷ Key messages from the Disease Control Priorities showed that many of the most needed surgeries are affordable and feasible to deliver and improving their coverage and quality will need a focused effort to strengthen the health system, especially in the frontline. It also noted that access to essential surgery should be implemented early in the path to UHC coverage, as part of the essential benefits packages advocated by LCoGS.⁸ One of the challenges that hamper improvement is the sociological phenomenon called the urban–rural divide.^{9,10}

As the name suggests, this creates disparities in health outcomes and access to care between people living in urban and rural communities.¹¹ For instance, a 2017 report in the United States revealed that rural residents have a slower decrease in overall mortality rates but higher chances of getting sick (i.e., cancer, stroke, and heart disease).¹² Also, a study done by Wulandari and colleagues¹² revealed that urban Indonesian and Filipino women are 1.255 and 0.932 times more likely to make ≥ 4 antenatal care visits than their rural counterparts.

In the Philippines, the same inequity is observed particularly when it comes to the urban–rural divide. With more than half of the population (52.85%) living in rural areas, access to surgery becomes a major challenge that further impedes the much-needed health of an economically productive workforce.¹³ This disparity is being addressed by several health policies including the enactment of the Universal Health Care (UHC) Act (RA 11332) in 2019, which upholds the principle of an integrated and comprehensive approach to healthcare. This ensures that all Filipinos have access to quality, cost-effective, promotive, preventive, curative, rehabilitative, and palliative health services without causing a financial burden.¹⁴ The need for the provision of essential surgery, in the context of primary health care, should now be recognized. It should be accessible, continuous, comprehensive, and coordinated at the time of need as parallel to what primary health care is defined.¹⁴

World Health Organization (WHO) defines emergency and essential surgery as a set of procedures covering emergency, surgery, anesthesia services for obstetric-related, injuries, catastrophes, surgery and other surgical situations done at primary/first referral-level health amenities.¹⁵ Investing in such for sectors unable to

access them, particularly those from rural areas, in a bigger scope of the population proved to be efficient as health improvements stimulate economic development (e.g., the effect of improved health on labor productivity, education, investment, access to natural resources and the ratio of workers to dependents).¹⁶ Cost-effectiveness analysis studies also proved that surgeries (e.g. cleft-lip repair, cataract, inguinal hernia, circumcision, Cesarean section, and trauma) had a significant benefit-cost ratio based on disability-adjusted life year, particularly those done in an LMIC first-level hospital.¹⁷ Cost of surgical care is perceived and often causes catastrophic financial impoverishment to Filipinos. Inclusion of universal coverage of essential surgery within the universal public finance would remove financial barriers to access to essential surgical care and would offer a degree of financial risk protection.⁷ To monitor the progress of emergency and essential surgery implementation, studies have to be conducted. Unfortunately, there has been no formal study conducted yet in this context. As a starting point, Local Government Unit(s) (LGUs) in the country can perform studies on either 2 of 6 recommended Lancet Commission on Global Surgery (LCoGS) metrics: assessing surgical volume; or surgeon, anesthetist, and obstetrician provider density for 100,000 as done by James et al.¹⁸ using current (e.g., facility-level surgical reports) and emerging (i.e., National Health Workforce Registry [NHWR]¹⁹) resources. Considering the geographical landscape and resources of each LGU in the Philippines, assessing Bellwether access within 2 h-time limits to a Bellwether-capable hospital might pose a challenge.

This urban–rural divide is a manifestation of the upfront challenges of Philippine diversity at different levels. The Philippines is a country of 110 million people living on 7107 islands. Despite an ongoing transition from a low to a middle-income country,²⁰ inequities persist across regions, between urban and rural areas, and between ethnicities.^{21,22} Inequities identified are severe underinvestment of the government in health facilities, services, and manpower despite ballooning population; political instability due to insurgency problems leading to reduced access to care among households in areas of civil unrest; jobless growth; topography of the country which impinges the delivery of health resources and households' access to healthcare; and frequent disasters and environmental risks.²²

This situation is further affected by the increasing prevalence of noncommunicable diseases (NCDs), which include cancer, cardiovascular diseases, chronic respiratory diseases, diabetes, and accidental injuries.²³ Surgical cases, such as malignant neoplasms (from rank 5 to rank 3) and accidents (from rank 9 to rank 5), were noted to be the leading cause of mortality in the Philippines from 1977 to 2010.²⁴ These problems are also exacerbated by the maldistribution of healthcare providers in the Philippines.

Most physicians in the country are stationed in urban areas, while only 20% are in public health facilities which cover 70% of the healthcare needs of the population. The specialized, lifesaving surgical procedures are limited to physicians with training concentrated in urban areas.²⁵ The only study in the Philippines that described the surgical health system in 1999 by Limson et al.,

described that the skew toward the urban centers is primarily because of better financial and professional remuneration.²⁶ Moreover, economic conditions have influenced the influx and development of new surgical technology limited to a few, well-financed private medical centers in the urban area.

Private, and nongovernment organizations have tried to mitigate these identified gaps with surgical missions. Sporadic local and international organizations have tended to rural areas with surgical needs. However, short-term initiatives by outside surgeons (surgeons not living and working in the area) seem only beneficial if there are no other options. Otherwise, suboptimum outcomes, unfavorable cost-effectiveness, and lack of sustainability reduce their usefulness.⁷

1.1 | The global and local situation of rural surgery

Rural surgery (RS) in developed countries, as in the United States and Australia, describes the practice of general surgery in rural areas, or outside the metropolitan area.^{27,28} For developing countries in Africa (e.g., Malawi and Zambia),²⁹ RS includes task-shifting to nonphysician clinicians.³⁰ In India, rural surgeons are trained general surgeons for rural practice.³¹ One of the enablers of its success is its geographical setting where these areas with institutionalized RS have a common “landmass” which makes resource sharing easier. Further, RS activities are based on National Surgical, Obstetric, and Anesthesia Plans created and in force by these countries. This is different in the Philippines for several reasons.

As an archipelagic country, the Philippines has no “landmass” that facilitates better resource sharing. Even with the current service delivery networks³² in place, surgical services are still limited in rural areas due to the absence of plans (i.e., National Surgical, Obstetric, and Anesthesia Plans [NSOAPs]) and national positions. Despite this, there is a potential for development. If the concept of RS can be introduced in developing countries with minimal access issues, the more it should be implemented in disadvantaged (geography, dispute, and poverty) LMICs such as the Philippines.

1.2 | The concept of the philippine rural surgery: Model, tenets, and responsibilities

Apart from the lack of formal plans, the current Philippine health delivery system provides clues on the barriers to its implementation. Due to the devolved governance³² structure in the country, all basic services (including health) have been transferred to LGUs from the national government. As different LGUs have varying degrees of development, their resources also vary; thus, resulting in inequitable health service provision to their constituents. The urban-rural divide deepens this inequity across the country. A practical long-term and feasible surgical program should be introduced that will provide essential surgery in the rural primary health care setting that is universal, accessible, cost-effective and safe, especially for the marginalized and underserved. This is foresighted as the concept of PHILIPPINE RURAL SURGERY.

As proposed by the authors, the Philippine Rural Surgery model embraces the overarching challenges in access to equitable essential surgical service with a bias toward the geographically, socially, financially, and politically marginalized Filipinos. Its coverage is universal, with essential surgical procedures as the range of service provision. Incorporating this model in the UHC implementation in the Philippines is projected to provide efficient health financing for the government and the patients. This will also increase retention for rural surgeons since financial and professional returns will be more secured.

Further, the authors proposed the following as its tenets for Philippine Rural Surgery:

1. No Filipino will be “surgically” left behind.
2. Essential surgical service is one of the forefronts in primary health care.
3. Decentralization of surgical practice in rural areas.
4. Rural Surgeons as champions of early disease detection through cancer screening.
5. Local government units as champions of a strong surgical health system.
6. Benefits of technology enjoyed by the masses.
7. Progressive surgical training thru living and online mentoring and training.

Finally, to complement the tenets and the model, the authors proposed the following recommendations by adopting to WHOSS framework³³ with the principles of UHC as its goal. The framework involves six interdependent building blocks working together to improve one's health system. Although every building block has essential tasks to perform, these must jive with other components to achieve the end goal (UHC) regardless of the manner of organization. These were palpably applied to the tenets of Philippine Rural Surgery due to its simplistic understanding and multistakeholder partnership involvement.

A. Service Delivery (with LGU, DOH, and Civil Society groups)

1. Decentralize essential surgical care by strengthening and capacitating rural health units and community hospitals to handle surgical cases first-hand.
2. Decongest tertiary hospitals with essential surgery procedures and relocate them to secondary or ambulatory surgical centers. Further discussion and discourse opportunities should be encouraged with relevant stakeholders to determine the list of essential surgery operations in the Philippine context.
3. Empower the Municipal Health Officer as the champion of primary surgical care. They should be at the forefront in identifying the surgical need of a particular patient and recognizing the risk factors of locally prevalent diseases.
4. Enhance the service delivery network and surgical referral system from the community hospital to the nearest tertiary hospital to prevent delays in management. This is to ensure sufficient

coordination and feedback in preparation for scaling up of surgical services.³⁴

- Promote relatable public health activities and lectures that will educate the people on early disease recognition. This may also increase the rate of cancer surveillance-related consults that may decrease cancer-related morbidity and mortality.

B. Health Workforce (with Board of Medicine – Professional Regulation Commission, Philippine Medical Association, Surgical Specialty Organizations, Commission on Higher Education, Department of Health, Philippine Board of Anesthesiology)

- Revitalize the surgical training by instilling a community rotation in nearby rural areas. In 2018, 71 accredited General Surgery institutions produced 100–130 graduates per year.³⁵ According to the WHO, the specialized surgical workforce density in the Philippines was 9.6/100,000³⁶ population in 2014. Based on the World Federation of Societies of Anaesthesiologists (WFSA),³⁷ the country has 3510 anesthesia providers (physicians), resulting in a physician anesthesia provider density of 3.49/100,000 population. This density is higher compared with Indonesia (0.7) and Malaysia (2.87), but lower when compared China (5.12). The 3-year residency training in anesthesia is done at any of the 59 accredited training centers, with almost half located in the National Capital Region.³⁸

A 3–6 month community rotation of senior residents may help alleviate the surgical burden in the rural areas. An accredited institution may adopt a 4th–5th class municipality with more than 2 h of access to a Bellwether-capable hospital. A model in Australia suggested surgical service delivery linkage between a regional hospital and a tertiary hospital such that if a newly-qualified specialist went to a rural post for a 2-year tenure, a position at the teaching hospital upon their return to the city can be guaranteed.²⁸

Safe surgeries may be assured because of the mandated morbidity and mortality audit and the supervision of accredited surgeons. Evidence shows that midlevel operators can safely do several essential surgical procedures, provided that they are properly trained and supervised and perform the operations frequently.³⁹ Task shifting to non-physicians may impact patient safety and may not be allowed by governing surgical institutions.

- Establish a Rural Surgery training program/fellowship that will embody the 5-star physician attributes – clinician, researcher, teacher, manager, and community mobilizer. The program should incorporate a strong surgical competency with essential surgical procedures in the social context of primary health care.
- Applicable financial remuneration, nonmonetary incentives and further training should be given to Rural Surgeons as this may increase retention and professional actualization.

C. Information (With DOH, Hospital administrators, LGUs, & Department of Information and Communications Technology)

- Establish a robust database of medical records that may be used for future research in RS. The recent establishment of the

NHWR¹⁹ provides complementary information on the current workforce concerning RS.

- Incorporate social determinants of health information in analyzing contributory factors to patients' disease. Filipinos have very strong family ties and are very relatable to their environment. Recognizing the trends in the health care system will not just cure the sick patient, but the family and community as well.
- Monitor, analyze, refine, implement, and duplicate best practices of the initial experiences of rural surgery.

D. Medical products and technology (with DOH, LGUs and Health Technology Assessment Council)

- Promote surgical remote learning thru surgical “telementoring”. This technological innovation may increase patients' safety and surgical training supervision during difficult procedures when the experience and expertise of distant surgeons are needed. Coordinated communications between stakeholders, monitoring and re-evaluation of mentoring strategies can help assess its sustainability.⁴⁰
- Ensure adequate surgical needs, supplies and equipment to first level hospitals.
- The latest technological advancements in surgical care should not be limited to urban centers. The advantages of laparoscopic approaches should also be enjoyed by the underserved.

E. Health Financing (with Philippine Health Insurance Corporation, DOH, Private Sector)

- Universal coverage for all Filipinos to access essential surgical care.
- Create case rates for essential surgical procedures done at a first-level institution which will cover all patients' expenses, surgical team fees, and hospital fees.
- Allocate more funding to provide essential surgery. Cost-effectiveness studies showed that it will generally prove both equitable and efficient to achieve full access to essential surgery at high quality rather than committing public resources to expand the range of services for a smaller proportion of the population.⁷
- Strengthen Public-Private Partnerships to support rural surgery initiatives.
- Ensure financial risk protection of essential surgical procedures. Financial risk management and economic evaluation studies should be planned as there are no formal studies done under this context, especially transport costs for direct medical costs to reach a hospital. Findings from these studies will be very helpful for decision and policymakers to plan the succeeding steps accordingly.

F. Leadership and Governance (with DOH, Philippine College of Surgeons, Board of Medicine – Professional Regulations Commission, national and local government)

- Empower national and local leaders to recognize the need to invest in rural surgery as a cost-effective master plan to address essential surgical needs in the community.

2. Craft and enact local and national legislation to implement RS.
3. Jointly with the administrators of the Philippine College of Surgeons and the Department of Health, create stipulations and limitations in the practice of RS.

2 | CONCLUSION

Access to surgical health services can address long-overlooked gaps in health care, particularly for marginalized populations. In the Philippines, Rural Surgery may be introduced alongside health system reforms emanating from recent national legislation that commits the country to universal health care (UHC). Although nations spanning the whole spectrum of socioeconomic development are now attempting Rural Surgery, the Philippines may have to contend with unique challenges, if not more, and other hindrances hampering development. We propose to initiate discussions to institutionalize Philippine Rural Surgery guided by frameworks such as the World Health Organization Health Systems Strengthening framework and the PHC approach towards adoption. Especially in these infantile stages, the movement should articulate its normative directions both on the technical plane and in terms of foundational principles. The former will require research-informed pilot implementation aimed at policymaking. For the latter, the authors propose a set of core beliefs to guide the surgical and universal health care communities so that they can work together on what is inescapably and ideally a fusion of their two domains. This perspective is aimed to start a meaningful discourse with society especially the health, government, and civil society sectors for the formalization of this needed intervention.

AUTHOR CONTRIBUTIONS

Brent Andrew G. Viray: Conceptualization; writing – original draft. **Crisostomo E. Arcilla:** Writing – original draft. **Anthony R. Perez:** Writing – original draft. **Jose Rafael Marfori:** Writing – original draft. **Attallah Ahmadi:** Conceptualization; writing – original draft; writing – review & editing. **Don Eliseo Lucero-Prisno:** Conceptualization; writing – review & editing.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Not applicable, no new data was generated.

TRANSPARENCY STATEMENT

The lead author Attallah Ahmadi affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

ORCID

Attallah Ahmadi  <http://orcid.org/0000-0001-6687-4526>

REFERENCES

1. Meara JG, Leather AJ, Hagander L, et al. Global surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386(9993):569-624. doi:10.1016/S0140-6736(15)60160-X
2. Rastogi A, Agarwal A, Singh PK, Haldar R, Kannaujia A. Distributing pulse oximeter: an initiative for improving patient safety and care. *Indian J Anaesth*. 2017;61(7):594-596. doi:10.4103/ija.IJA_89_17
3. Groen RS, Samai M, Stewart KA, et al. Untreated surgical conditions in Sierra Leone: a cluster randomised, cross-sectional, countrywide survey. *Lancet*. 2012;380(9847):1082-1087. doi:10.1016/S0140-6736(12)61081-2
4. Weiser TG, Regenbogen SE, Thompson KD, et al. An estimation of the global volume of surgery: a modelling strategy based on available data. *Lancet*. 2008;372(9633):139-144. doi:10.1016/S0140-6736(08)60878-8
5. Jamison DT, Breman JG, Measham AR, et al. *Disease Control Priorities in Developing Countries*. 2nd ed. Oxford University Press; 2006.
6. WHO. The scale of the problem: how injuries claim lives. *World Heal J*. 2004;1:1-6. https://www.who.int/violence_injury_prevention/key_facts/VIP_key_facts.pdf
7. Mock CN, Donkor P, Gawande A, et al. Essential surgery: key messages from disease control priorities, 3rd edition. *Lancet*. 2015;385(9983):2209-2219. doi:10.1016/S0140-6736(15)60091-5
8. Nit B, Samy AL, Tan SL, et al. Understanding the slow COVID-19 trajectory of Cambodia. *Public Health Pract (Oxf)*. 2021;2(100073):100073. doi:10.1016/j.puhip.2020.100073
9. Qaderi S, Mousavi SH, Ahmadi A, et al. Transfusion-dependent beta thalassemia in Afghanistan: current evidence amid COVID-19 and future recommendations. *Hematology*. 2021;26(1):432-434. doi:10.1080/16078454.2021.1938814
10. Ali Mohamed EM, Alhaj Abdallah SM, Ahmadi A, Lucero-Prisno DE III. Food security and COVID-19 in Africa: implications and recommendations. *Am J Trop Med Hyg*. 2021;104(5):1613-1615. <https://www.ajtmh.org/view/journals/tpmd/104/5/article-p1613.xml>
11. Warshaw R. Health disparities affect millions in rural U.S. communities [online]. AAMC 2017. Accessed November 17, 2021. <https://www.aamc.org/news-insights/health-disparities-affect-millions-rural-us-communities>
12. Wulandari R, Laksono A, Rohmah N. Urban-rural disparities of antenatal care in South East Asia: a case study in the Philippines and Indonesia. *BMC Public Health*. 2021;21(1):1221. doi:10.1186/s12889-021-11318-2 Available from <https://bmcpubhealth.biomedcentral.com/articles/10.1186/s12889-021-11318-2>
13. Philippines - Rural population 1960-2019 Data | 2020 Forecast. Accessed September 27, 2020. <https://tradingeconomics.com/philippines/rural-population-percent-of-total-population-wb-data.html>
14. Republic of the Philippines. Republic Act 11223 - Universal Health Care Act. 2018.
15. World Health Organization. Essential surgical care makes a difference [Internet]. Who.int. 2009. Accessed November 14, 2021. https://www.who.int/surgery/publications/Flyer2009_4page.pdf
16. Jamison DT, Summers LH, Alleyne G, et al. Global health 2035: a world converging within a generation. *Lancet*. 2013;382(9908):1898-1955. doi:10.1016/S0140-6736(13)62105-4
17. Grimes CE, Henry JA, Maraka J, Mkandawire NC, Cotton M. Cost-effectiveness of surgery in low- and middle-income countries: a systematic review. *World J Surg*. 2014;38(1):252-263. doi:10.1007/s00268-013-2243-y
18. James K, Borchem I, Talo R, et al. Universal access to safe, affordable, timely surgical and anaesthetic care in Papua New Guinea: the six global health indicators. *ANZ J Surg*. 2020;90(10):1903-1909. doi:10.1111/ans.16148

19. DOH-PRC Joint Administrative Order 2021-0001: Guidelines on the Establishment, Utilization, and Maintenance of the National Health Workforce Registry (NHWR). [Doh.gov.ph](http://doh.gov.ph). 2021. Accessed March 14, 2022. <https://doh.gov.ph/sites/default/files/health-update/DOHPRCjao-0001.pdf>
20. Keenan J. The grim reality behind the Philippines' economic growth. *The Atlantic*. 2013.
21. Bersales LGS. Philippines national demographic and health survey 2013. *Philipp Stat Auth*. 2014;1:335.
22. Picazo OF, Ulep VGT, Ortiz DAP, Aldeon MP, dela Cruz NAO. Explaining the large disparities in health in the Philippines. *PIDS Policy Notes*. 2013;8:8.
23. Cabral EI. The Philippine health agenda for 2016 to 2022. *Philippine J Intern Med*. 2016;54(2):1-11.
24. Department of Health Philippines. Philippine Health Statistics 1982-2010.
25. Sandoval E. Doctor shortage in the Philippines: an analysis. *Mims today*. 2016.
26. Limson AA, Danguilan JLJ, Gutierrez RR, De Jesus RS, Crisostomo AC, Roxas AM. Surgery in the Philippines. *Arch Surg*. 1999;134(3):323-327. doi:10.1001/archsurg.134.3.323
27. Cogbill TH, Cofer JB, Jarman BT. Contemporary issues in rural surgery. *Curr Probl Surg*. 2012;49(5):263-318. doi:10.1067/j.cpsurg.2012.01.002
28. Bruening MH, Maddern GJ. Rural surgery: the Australian experience. *Surg Clin North Am*. 2009;89(6):1325-1333. doi:10.1016/j.suc.2009.07.004
29. SURGAfrica. Publications [Internet]. Accessed November 17, 2021. <https://www.surgafrika.eu/outputs2.html>
30. Atiyeh BS, Gunn SWA, Hayek SN. Provision of essential surgery in remote and rural areas of developed as well as low- and middle-income countries. *Int J Surg*. 2010;8(8):581-585. doi:10.1016/j.ijsu.2010.07.291
31. Mehendale V. Rural surgery in India. *World J Surg*. 2007;31(9):1898-1899. doi:10.1007/s00268-007-9161-9
32. Dayrit M, Kagrada L, Picazo O, Pons M, Villaverde M. *The Philippines Health System Review: Health Systems In Transition* [Internet]. 8th ed. WHO, 2018. <https://apps.who.int/iris/bitstream/handle/10665/274579/9789290226734-eng.pdf>
33. World Health Organization. *Everybody's Business - Strengthening Health Systems to Improve Health Outcomes*. World Heal Organ Press. 2007.
34. Gajewski J, Bijlmakers L, Brugha R. Global surgery—informing national strategies for scaling up surgery in Sub-Saharan Africa. *Int J Health Policy Manag*. 2018;7(6):481-484. doi:10.15171/ijhpm.2018.27
35. Viray B, Dajay C, Ocampo O, Ayuste E, Chucueco MC. Ten year summary of annual reports of the Philippine Society of General Surgeons Accredited Training Programs. Unpublished.
36. WHO Regional Office for the Western Pacific. Action framework for safe and affordable surgery in the Western Pacific Region (~2030) [Internet]. WHO; 2021. Accessed November 16, 2021. <http://apps.who.int/iris/bitstream/handle/10665/340914/9789290619345-eng.pdf>
37. World Federation of Societies of Anaesthesiologists. Workforce Map [Internet]. WFSA. 2021. Accessed November 18, 2021. <https://wfsahq.org/resources/workforce-map/>
38. Philippine Board of Anesthesiology. Accredited Residency Training Programs [Internet]. Accessed November 16, 2021. https://pba-ph.com/pba_website/index.php/Artp_Controller9
39. McCord C, Mbaruku G, Pereira C, Nzabuhakwa C, Bergstrom S. The quality of emergency obstetrical surgery by assistant medical officers in Tanzanian district hospitals. *Health Aff*. 2009;28(5):876-885. doi:10.1377/hlthaff.28.5.w876
40. Broekhuizen H, Ifeanyi M, Mwapasa G, et al. Improving access to surgery through surgical team mentoring - policy lessons from group model building with local stakeholders in Malawi. *Int J Health Policy Manag*. 2021. doi:10.34172/ijhpm.2021.78

How to cite this article: Viray BAG, Arcilla Jr CE, Perez AR, et al. Strengthening rural surgery in the Philippines: essential in achieving universal health care. *Health Sci Rep*. 2022;5:e846. doi:10.1002/hsr2.846