

## Reorganizing Hospital Cancer Care In Nepal

Bishnu Dutta Paudel,<sup>1</sup> Richard R. Love,<sup>2</sup> Deepak Sundar Shrestha<sup>3</sup>

### ABSTRACT

While mortality rates for major common cancers—of the lung, breast, stomach, ovary, and lymphomas-- have declined significantly in high-income countries over the last decade, comparable rates for these malignancies have not fallen in Nepal. The explanations for the high-income country mortality trends are multiple and certainly include incidence reductions, but better treatments are also contributory. How to bring to Nepal the global lessons in achieving better cancer care is uncertain. We need to create an environment of ideas and a powerful vision to meet the needs for better major cancer management for Nepalis.

Broadly, the Nepalese challenges are in creating more accessible and affordable care of sufficiently high-quality to make a difference. Hospitals are the major places where these issues have to be considered. To address these challenges, we offer a vision and suggest here strategies of major organizational changes in: Innovative staffing models, emphasizing teamwork, with increases in responsibilities, activities and work force percentages of non-physician health professionals; Increased outpatient care and tele-health; 3. Creating and following evidence-based diagnostic pathway and treatment clinical practice guidelines and checklists; 4. Increased application of information technology tools, particularly electronic medical records; and 5. Service implementation research evaluating quality based on structure, process and outcomes of care. Developing such effective changes requires strong community linkages, local institutional-specific coalition initiatives and experimentation, and national and international collaborations and financial support to effect practical and data-based plans and budgets.

**Keywords:** Guidelines; improving treatment; information technology tools; outpatient services; staffing models; tele-health

### INTRODUCTION

“The future is here; it is just not widely distributed.”<sup>1</sup> “What we have before us are some breathtaking opportunities disguised as insoluble problems.”<sup>2</sup> “Where there is no vision, the people perish.”<sup>3</sup> The delivery of positively impactful cancer care for populations is a global challenge which is of greater magnitude in low- and middle-income countries like Nepal, with limited resources of many kinds. There is, however, huge international experience in meeting this challenge, which should be brought to bear thoughtfully on our Nepalese circumstances. In the current communication we consider critical data and strategies that can be creatively applied to our cancer hospital activities to better serve our patients without major increases in financial outlays.

### PRESENT SCENARIO

Mortality rates are decreasing overall and for most major common cancers in high-income countries Table 1.<sup>4,5</sup>

Table 1. Annual percentage change, age-adjusted, for all sites and selected major cancers, United States SEER data, 2008-2017.<sup>4,5</sup>

Site	Annual percentage change
All	1.6
Lung	3.2
Breast	1.6
Colon/rectum	2.1
Lymphoma	2.2
Ovary	2.4
Stomach	2.0
Oral cavity and pharynx	0.1

The situation in Nepal is not similarly favorable. Essentially there have been no changes in overall mortality from cancer and a disease-specific decrease in mortality only for uterine cervical cancer Table 2.<sup>6</sup> These data accord with those from Globocan.<sup>7</sup> As Table 3 illustrates, the listed cancers in Table 2 are the major causes of cancer mortality in Nepal.

**Correspondence:** Dr Deepak Sundar Shrestha, Richa Bajimaya Memorial Foundation, Kathmandu, Nepal. Emails: [dpakshrestha@gmail.com](mailto:dpakshrestha@gmail.com), [deepak@richafoundation.org](mailto:deepak@richafoundation.org). np, Phone: +9779851175988.

Table 2. Nepal mortality trends from selected cancers, 2000-2012.<sup>6</sup>

Site	Trend
Lung, men	Increase
Lung, women	Slight decrease
Stomach, men	Slight decrease
Stomach, women	No change
Lymphoma, myeloma, men	No change
Breast	No change
Ovary	No change
Uterine cervix	Major decrease

Table 3. Nepal, gender percentages of all cancer deaths from selected cancers.<sup>6</sup>

Lung, men	17.0%
Lung, women	14.3%
Mouth, pharynx, men	13%
Stomach, men	9.3%
Stomach, women	5.7%
Lymphoma, myeloma, men	7.2%
Breast, women	11.6%
Ovary, women	7.0%
Uterine cervix, women	18.4%

Population mortality from cancers can change for multiple reasons: changes in incidence with changes in causal frequencies; changes in care-seeking behavior associated with stages of disease at diagnosis and consequent treatment outcomes; and development of more effective treatments and their widespread delivery to patients-in-need. It is possible that more recent data in Nepal will present more favorable pictures than those presented in Tables 2 and 3.

In Nepal, the necessary causes of the most common cancers are clear, but favorable impacts of appropriate measures to address these are not yet being seen. In another companion communication, we have suggested accelerating country-specific strategies and efforts in cancer prevention.<sup>8</sup>

At population health levels, health care-seeking behavior for cancer in Nepal does not appear to be changing. Positively influencing such behavior might most successfully be achieved by greater public perceptions of affordability and curability/treatability of cancers, and more patient-centered care.

Prevention and care-seeking behavior strategies appear to have contributed to the better mortality data being

reported from high-income countries, but it is also very clear that better treatments have also made major contributions to these improved outcomes. To then review some conclusions from Tables 1-3: and their specific implications for population-affecting treatment efforts in Nepal:

\*Lung cancer is the major cause of cancer death in men and the second cause in women, and despite encouraging trends in prevalence of tobacco smoking in both genders (with recent decade decreases of 7-11%), mortality rates remain high and are unfortunately increasing in men (Table 3).<sup>6,9</sup> In contrast, lung cancer mortality in the U.S. has declined an astonishing 32% over a 10-year period (Table 1). This has occurred together with a decline of 8% in prevalence of tobacco smoking over a recent 14-year time period.<sup>10</sup> While a decline in lung cancer risk begins soon after cessation of tobacco smoking, getting to minimally increased risk only, occurs over many years. Taken together these data suggest that better treatment of lung cancer has had a major impact in the U.S. in the last decade, and such progress not yet seen, might be possible in Nepal.

\*Breast cancer is the third major cause of cancer death in Nepali women, and again favorable trends have been absent (Tables 2 and 3).<sup>6</sup> In the U.S., a recent mortality decline of 16% in a decade has been observed (Table 1).<sup>4,5</sup> While fractional attribution of the explanations for this decline in the U.S., between “early detection” and treatment interventions is complex, it is clear that a major contributor to this decline has been better treatment. Again, taken together these data suggest that major progress with this malignancy should be possible in Nepal.

\*Lymphoma and myeloma together in men remains a major and unchanged cause of mortality in Nepal, while mortality from lymphoma alone has decreased by almost 11% in a recent decade in the U.S., and the decline in myeloma has been even greater (Tables 1-3).<sup>4</sup> <sup>6</sup> Better treatment in the U.S. appears to account for the different experiences.

\*Cancer of the ovary in women continues as a major and unchanging cause of mortality in Nepal, while mortality from this malignancy has decreased by almost 25% in a recent decade in the U.S. (Tables 1-3).<sup>4,6</sup> Again, better treatment in the U.S. is clearly the most likely explanation for these differences.

\*For other common and significantly lethal cancers in Nepal—head and neck, stomach, and cervix—the contributions of better treatments in the U.S. currently

appear to be minimal to modest. For head and neck, treatment is having minimal impact on mortality rates in the U.S. (Table 1).<sup>4,5</sup> For stomach cancer, in the U.S. the major contribution to decreasing mortality is from decreased incidence. Finally, for cervical cancer, both incidence and associated mortality are fortunately declining in Nepal, consequent to major efforts in early detection and treatment of pre-malignant lesions. Cervical cancer remains, however, the leading cause of cancer death in women, which situation suggests that better treatment may offer also a means for improving outcomes from this malignant process.

In Nepal, hospitals are the major sites where cancer is diagnosed and treatments are provided and thus, for the present, it is here to focus of attention in considering how Nepal can improve cancer mortality rates. As suggested above, as a general premise, better cancer treatments across the board may be expected to achieve improved outcomes for Nepali patients, but the evidence is particularly strong for lung cancer in both genders, lymphoma/myelomas in men, and breast and ovarian cancers in women, each of which is a major cause of cancer mortality in the country (Table 3). The major challenges for Nepal, as for most of the world's population, are providing cancer treatments affordably, and in rigorous and adequately high-quality ways equitably across Nepalese society to attain better outcomes for Nepali patients.<sup>11</sup>

Following from this summary of outcomes for selected cancers, the goal of this communication is to consider within a framework of quality of care, the major strategies of organizational characteristics and prioritized changes in our cancer hospitals which can allow us to meet these challenges. It is our belief that the ideas, evidence and resources are available and that, to paraphrase Steve Jobs, “connecting the dots”, and in some ways leapfrogging, in the Nepalese circumstances, is the way forward.<sup>1,12</sup> To be effective, the vision we present should be imaginable—that is it should offer a picture of the future; desirable—that is appealing to the multiple stakeholders in our institutions; feasible—that is realistic and attainable; focused; flexible; and easy to communicate.<sup>13</sup>

## CHALLENGES

### Common approaches to issues of affordability and quality of cancer care

The case is generally presented that the unaffordability of care is a broad societal problem, requiring greater public financial resources and the discussion stops there.

We suggest that it is very much worthwhile to consider what hospitals can do to increase access, affordability, and efficiency.

The quality subject is usually answered by saying that the needs are for increased specialist manpower; increased medical services capacity (i.e. more hospitals); and increased diagnostic and staging/imaging capacities.<sup>14</sup> The challenges of these approaches are: financial resources, evidence of but marginal benefits, and high cost/benefit ratios. This communication focuses on what current cancer hospitals themselves can do to develop better quality care with the resources at hand.

### Lessons from broad perspectives on improving cancer care

Sustained development goals.<sup>15</sup> While calling for a reduction by one-third in premature mortality from noncommunicable disease by 2030, only two of the 16 World Health Organization (WHO) Best Buys for the Prevention and Control of Noncommunicable Diseases concern cancer directly, and these call respectively, for HPV vaccination and cervical cancer screening and treatment of pre-cancerous lesions.<sup>15</sup> Five other Best Buys are directed at reducing tobacco use. The take-home indirect lesson is that the case for emphasis on better treatment for cancers needs to be strongly evidence-based and financial-resource conscious.

Rosling emphasizes that often we are relying on or believe outdated facts, or misinterpret the facts; and these errors lead to wrong intuitions about the way things really are, and as a consequence what needs to be done.<sup>16</sup> Lessons for cancer are that we need to be rigorous in our fact and interpretation assessments of how to achieve better outcomes for our patients.

Crisp writes that we need to: #1. Tackle our 21<sup>st</sup> century problems, not with outdated ideas and tools, but in a paradigm shift with global perspectives and tools and transform our health services; #2. Have more services outside of hospitals; #3. Alter our expectations about uses of equipment and new therapies and focus more on metrics of value received from our activities; #4. Challenge the top down, professionalized and commercialized models for how we approach health care; and #5. Critically, start by understanding society, valuing the important roles of communities in health and healthcare, and better apply our global knowledge from the natural and social sciences.<sup>17</sup> These lessons suggest very practical and specific strategies for our hospitals.

Melinda French Gates has championed the importance of

putting women and girls at the center of development, as engines and change agents.<sup>18</sup> These perspectives are in a context of economic development being increasingly seen as dependent on population health, and chronic gender inequality as a significant drag on such broader progress. Her equity lesson is that we need to see our better treatment efforts in larger societal economic and ethical goal contexts.

Christensen argues that we need disruptive innovation in health care.<sup>19</sup> A key element is application of technological enablers. He argues that we need to standardize our processes, making them rules-based, simpler, and affordable. Otherwise stated, we need to break down the “care” in cancer care into specific tasks, and crucially, bring-to-bear information technological enablers to make successful completion of the tasks possible. The lesson here is that we need to rethink our organized ways of doing business.

Emmanuel, in reviewing transformational practices of highly effective American health organizations, highlights essential elements, three of which appear critical in Nepal: leadership, organizational culture, and key data.<sup>20</sup> Leadership defines direction and strategy and prioritizes implementation steps. The critical aspect of an organization’s culture is the looking by employees relentlessly for guidance in their work. The critical data are those impacting expenses excessively, and those on staff performance. His lessons are that translating what we know needs thoughtful leadership and management.

Scott and Jha have highlighted the importance of quality in improving population health, emphasizing that access is not enough, and noting the six key features of high-quality care described by the American Institute of Medicine: safety, effectiveness, patient-centeredness, efficiency, timeliness and equitability.<sup>11</sup> The safety of hospital care is a critical concern; in-hospital adverse events appear to account for injuries among the top 20 causes of disability and death globally.<sup>21</sup> Care is far too often ineffective, and sub-optimally patient-centered. The lessons here are provision of a framework and of very specific features important for Nepalese hospital quality efforts.

Finally, the global Covid pandemic has highlighted the importance of within societal and cross society connectedness, and of public health systems/ infrastructure.

These foregoing broad perspectives and their suggested lessons help us to answer the Nepalese questions of why we are not currently providing affordable and high-

quality care, and issues to be considered in successfully addressing challenges.

**CHARTING THE FUTURE OF HOSPITAL CANCER CARE IN NEPAL**

**The framework for understanding and evaluating, and critical characteristics for achieving optimal affordability and difference-making quality of cancer care**

One half century ago, Donabedian proposed a framework for evaluating quality of health care: structure, process and outcomes.<sup>22</sup> Structure concerns primarily organization of the institution within its community, and internally. Processes are about the ways care is given. Outcomes concern the results we seek. Building on the broad lessons reviewed above, using Donabedian’s framework, here we propose a list of cancer hospital strategies which are critical in addressing Nepalese affordability and sufficiently high-quality of care challenges successfully (Table 4).

**Table 4. Selected strategic areas important in effecting high-quality cancer care in Nepal.**

Structure	<ul style="list-style-type: none"> <li>• Community linkages</li> <li>• Ambulatory and tele-medicine care capacities</li> <li>• Palliative care service</li> <li>• Physician and paraprofessional staffing models addressing productivity and efficiency</li> <li>• Mechanisms for catalyzing innovation: implementation research</li> </ul>
Processes	<ul style="list-style-type: none"> <li>• Teamwork</li> <li>• Staff work standards</li> <li>• Staff work tools: Information technologies</li> </ul>
Outcomes	<ul style="list-style-type: none"> <li>• Surveys of patient assessments of their care.</li> <li>• Audits of case management for intermediate metrics/benchmarks of high-quality care</li> <li>• Registry and follow up of served patients</li> </ul>

**Hospital Operational Strategies**

How can the strategies in Table 4 be operationalized to develop affordable and high-quality care, that is care which is safe, effective, patient-centered, efficient, timely and equitable?<sup>23</sup>

## STRUCTURES

### Community linkages

We believe that service institutional leaders and managers cannot reach affordability and high-quality of care goals solely by being better technocrats. The ethical and social dimensions (social cohesion) of our activities are important, and the ways an institution connects to the community can allow high returns.<sup>24</sup> Our cancer hospitals need to hyper-collaborate with their communities by:

\*Creating strong health/cancer public education activities in-house. Our hospitals need to be cancer-health teaching sites.

\*Modeling community behaviors.

Our cancer hospitals can be models as non-smoking facilities, providing safe medical waste disposal policies and procedures, limiting supply and packaging waste, and developing power use plans to achieve zero-net energy consumption.<sup>25,26</sup>

\*Outreach

We should foster community connections to address social determinants of health, and equity.<sup>26</sup> We should actively embrace our country's Ayurvedic wellness orientation of yoga, meditation, music treatment, diet, and exercise.

### Hospital as medical center

Throughout the world over recent decades, hospitals have evolved to becoming medical centers with ambulatory care clinics, shortened hospitalizations, several types of day visit care services and virtual tele-health visits.<sup>27-31</sup> The health care provider–historically physician–patient encounter is the health care choke point, defining what health care is. Other industries have become more efficient and have increased quality by facilitating self-service with baseline automation and exception management with information technology facilitators---electronic medical records (EMRs) and clinical decision-support systems.<sup>28, 29</sup> Point-of-care testing is important because remote or even “other-building-provided” testing leads to patients leaving the system before testing is accomplished.<sup>30</sup> With respect to cancer care, high quality imaging technology with point-of-care ultrasound is increasingly very useful in breast and gynecological tumor evaluation and staging, and for abdominal lymph node and liver imaging.<sup>31</sup> The World

Health Organization estimates that 80% of evidence guided medical imaging can be accomplished with a standard chest and bone radiographs and ultrasound.<sup>32</sup>

### Physician and paraprofessional staffing models

For several reasons---to increase efficiency and productivity, to decrease routine task burdens on the highest paid health professionals: physicians, and to decrease physician burnout, and to increase quality of care---progressive medical institutions worldwide are increasing their non-physician: physician staffing ratios, targeting levels of 8:1.<sup>19-21,27,33</sup> Christensen has emphasized the need to define the critical medical care tasks, and develop “specialists” to carry these tasks.<sup>19,27, 34</sup> Further staff performance can be more fairly and accountably assessed with better-defined roles and rigorous guidelines.<sup>20</sup>

### Palliative care services

In Nepal, hospitals caring for patients with cancer have a particular challenge to address the major need for palliative care for a large fraction of patients, because there are minimal public or private palliative care services.<sup>35</sup> Heretofore, there has been limited acknowledgement that palliative care is really specialty care. The authors of this communication have strongly advocated for development of para-professional palliative care specialists, better use of information technology tools and care delivery system changes.<sup>36</sup> The Nepalese Association for Palliative Care has developed a system and resources which can be used by any health care facility, accessible at [home.palliativecarenepal.net](http://home.palliativecarenepal.net).

### Mechanisms for catalyzing innovation: implementation research

Making the kinds of structural changes and fostering the kinds of process to be discussed below, requires that cancer hospitals really develop an innovation mindset.<sup>37</sup>

## PROCESSES

### Teamwork

As hospital cancer care has become more complex, the needs for management strategies and teamwork have increased.<sup>20</sup>

### Staff work standards

Absolutely key to getting to uniformly high-quality care

is development of rigorous local standards for diagnostic and treatment activities.<sup>20,38</sup> There are three major areas where our cancer hospitals need to have written standards: diagnostic services and treatment guidelines, and specific check-lists. These documents need to focus on available evidence, practicality, and value.<sup>39,40</sup> While written high-income country model treatment guidelines are available, their comprehensiveness and associated length make them less useful for Nepal.<sup>41</sup> Four years ago, under the Ministry of Health and Population, diagnostic and treatment protocols for common cancers were developed.<sup>42</sup> These protocols need to be updated --for lung and breast cancers--and new protocols need to be developed for cancer of the ovary, nodular lymphomas and myeloma.. Patient case-review tumor boards can then reinforce adherence to such guidelines. The checklist tool has been well demonstrated to contribute significantly to improvements in safety, notably with surgery.<sup>43</sup>

#### Staff work tools from information technologies

From provider and patient viewpoints, a key informational technology development has been the evolution of electronic medical records (EMRs). EMRs allow a transition from increasingly unmanageable paper-based operations. The benefits of EMRs for health care providers and patients are multiple.<sup>44</sup> The major challenges with EMRs have been their direct and indirect costs, and the complexity of their introduction into ongoing medical services, with established routines and work expectations.<sup>45</sup>

The overwhelming evidence suggests that EMRs improve health care for patients, but the challenges of creating and implementing EMRs seem overwhelming complex and endless.<sup>46</sup>

Our sense, regardless of the complexity, is that in our cancer hospitals we absolutely needed to get started down this creating- and implementing- EMR road: 1. Through involvement of multidisciplinary teams; 2. By focusing on users' needs; 3. By redesigning our care processes in parallel with our IT tools; and 4. By creating innovation forums—experimental sandboxes”.<sup>47,48,49</sup>

#### OUTCOMES

Donabedian argued that we cannot improve what we are not measuring.<sup>22</sup> We suggest that there are three areas in which we can begin measuring outcomes (Table 4):

surveys of patient assessments of their care, audits of case management for intermediate metrics/benchmarks of high-quality care and registry/follow up of served patients.

#### Leading and managing change

Our cancer hospitals, currently overwhelmed with immediate patient care challenges, cannot possibly, on their own, initiate many of the approaches we have suggested in this communication. Developing effective changes requires strong community linkages, local institutional-specific coalition initiatives and experimentation, and national and international collaborations and financial support to effect practical and data-based plans and budgets.<sup>19,20,37,50</sup> Internally, our cancer hospitals need to have more and multiple operational mechanisms working groups, innovation centers, and active executive/operations committees.<sup>48</sup>

#### CONCLUSIONS

Change starts with senses of urgency and needs, vision, strategies definition, and then political will, creating a coalition, motivating, and inspiring. Clarifying obstacles is key. It is an evolutionary process.<sup>13</sup>

In better cancer treatment, high-income country and Nepalese data suggest focusing on lung cancer in both genders, lymphoma/myeloma in men, and breast and ovarian cancer in women.

We need to prioritize possible and perceived achievable bold structural, process and outcome assessment strategies.

We need to then communicate a vision repeatedly and succinctly.

And then finally we need to manage the vision and strategies: Plan, budget, organize, staff, control the processes and problem-solve.

#### Author Affiliations

<sup>1</sup>Office of the Executive Director, Bhaktapur Cancer Hospital, Bhaktapur, Nepal

<sup>2</sup>Department of Computer Science, Marquette University, Milwaukee, Wisconsin, U.S.A.

<sup>3</sup>Richa Bajimaya Memorial Foundation, Kathmandu, Nepal

**Competing interests:** None declared

## REFERENCES

- Novogratz J. *The Blue Sweater: Bridging the Gap between Rich and Poor in an Interconnected World*. New York: Rodale; 2009. [Link]
- PBS - JOHN GARDNER - WRITINGS [Internet]. Pbs.org. 2021 [cited 30 July 2021]. Available from: <https://www.pbs.org/johngardner/sections/writings.html>
- Bible Gateway passage: Proverbs 29:18 - King James Version [Internet]. Bible Gateway. 2021 [cited 30 July 2021]. Available from: <https://www.biblegateway.com/passage/?search=Proverbs%2029%3A18&version=KJV>
- Browse the Tables and Figures - SEER Cancer Statistics Review (CSR) 1975-2017 [Internet]. SEER. 2021 [cited 30 July 2021]. Available from: [https://seer.cancer.gov/csr/1975\\_2017/browse\\_csr.php?sectionSEL=1&pageSEL=sect\\_01\\_table.26](https://seer.cancer.gov/csr/1975_2017/browse_csr.php?sectionSEL=1&pageSEL=sect_01_table.26)
- Browse the Tables and Figures - SEER Cancer Statistics Review (CSR) 1975-2017 [Internet]. SEER. 2021 [cited 30 July 2021]. Available from: [https://seer.cancer.gov/csr/1975\\_2017/browse\\_csr.php?sectionSEL=1&pageSEL=sect\\_01\\_table.07](https://seer.cancer.gov/csr/1975_2017/browse_csr.php?sectionSEL=1&pageSEL=sect_01_table.07)
- Who.int. 2021, [Internet]. [cited 30 July 2021]. Available from: [https://www.who.int/cancer/country-profiles/npl\\_en.pdf](https://www.who.int/cancer/country-profiles/npl_en.pdf)
- Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2018 Nov;68(6):394–424. [Article]
- Shrestha, DS, Love, RR, Paudel BD.: Cancer prevention strategies for Nepal. [Submitted]
- Shrestha N, Mehata S, Pradhan P, Joshi D, Mishra S. A nationally representative study on socio-demographic and geographic correlates, and trends in tobacco use in Nepal. *Scientific Reports*. 2019;9(1). [Article]
- Centers for Disease Control and Prevention. Current Cigarette Smoking Among Adults in the United States [Internet]. [cited 2021 Jul 30]. Available from: [https://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/adult\\_data/cig\\_smoking/index.htm](https://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/index.htm)
- Scott KW, Jha AK. Putting quality on the global health agenda. *N Engl J Med*. 2014 Jul;371(1):3–5. [PubMed] [Article]
- Jobs S. Commencement address Stanford University [Internet]. 2005 [cited 30 July 2021]. Available from: <https://www.youtube.com/watch?v=UIF8uR6Z6KLC>
- Kotter, J.P. (1996) *Leading Change*. Harvard Business School Press, Boston.
- Farmer P, Frenk J, Knaul FM, Shulman LN, Alleyne G, Armstrong L, et al. Expansion of cancer care and control in countries of low and middle income: a call to action. *Lancet* (London, England). 2010 Oct;376(9747):1186–93. [Article]
- Time to deliver: report of the WHO Independent High-level Commission on Noncommunicable Diseases. Geneva: World Health Organization; 2018. Licence: CC BY-NC-SA 3.0 IGO. <https://publichealthupdate.com/time-to-deliver-report-of-the-who-independent-high-level-commission-on-ncds/>
- Factfulness: Ten Reasons We're Wrong About the World--and Why Things Are Better Than You Think: Rosling, Hans, Rönnlund, Anna Rosling, Rosling, Ola: 9781250107817: Amazon.com: Books [Internet]. Amazon.com. 2021 [cited 30 July 2021]. Available from: <https://www.amazon.com/Factfulness-Reasons-World-Things-Better/dp/1250107814>
- Barr H. *Turning the World Upside Down: The search for global health in the 21st Century*, Nigel Crisp, London: Hodder Education 2010. *Journal of Interprofessional Care*. 2011;25(5):386–387. [Article]
- Gates MF. Putting women and girls at the center of development. *Science*. 2014 Sep;345(6202):1273–5. [PubMed] [Article]
- Christensen C, Grossman J, Hwang J. *The @innovator's prescription*. New York: McGraw-Hill; 2009. <https://www.hbs.edu/faculty/Pages/item.aspx?num=35729>
- Emanuel E. *Prescription for the future: The Twelve Transformational Practices of Highly Effective Medical Organizations*. New York: Perseus Books; 2017. <https://medhum.med.nyu.edu/view/17083>
- Jha AK, Larizgoitia I, Audera-Lopez C, Prasopa-Plaizier N, Waters H, Bates DW. The global burden of unsafe medical care: analytic modelling of observational studies. *BMJ Qual Saf*. 2013 Oct;22(10):809–15. [Download PDF]
- Donabedian A. Evaluating the quality of medical care. 1966. *Milbank Q*. 2005;83(4):691–729. [PubMed]
- Wolfe A. *Institute of Medicine Report: Crossing the Quality Chasm: A New Health Care System for the 21st Century*. Policy, Politics, & Nursing Practice. 2001;2(3):233–235. [PubMed]
- Glover SM. *Mark Nichter: Global Health: Why Cultural Perceptions, Social Representations, and Biopolitics Matter*: University of Arizona Press, 2008, 320pp (ISBN-10: 0816525749, ISBN-13: 978-0816525744, paperback). *Hum Ecol*. 2009/05/23. 2009 Oct;37(5):669–70.

- [Article]
25. WHO Healthy cities project [Internet]. Apps.who.int. 2021 [cited 30 July 2021]. Available from: <http://apps.who.int/iris/bitstream/handle/10665/108054/E58113.pdf?sequence=1>
  26. Marmot M, Wilkinson R. Social determinants of health. New York: Oxford University Press,; 1999.[Article]
  27. Duffy S, Lee TH. In-Person Health Care as Option B. N Engl J Med. 2018 Jan;378(2):104–6.[PubMed] [Article]
  28. Asch D, Nicholson S, Berger M. Toward Facilitated Self-Service in Health Care. New England Journal of Medicine. 2019;380(20):1891-1893.[PubMed][Article]
  29. Tuckson R V, Edmunds M, Hodgkins ML. Telehealth. N Engl J Med. 2017 Oct;377(16):1585–92.[Article]
  30. Jani I V, Peter TF. How point-of-care testing could drive innovation in global health. N Engl J Med. 2013 Jun;368(24):2319–24.[PubMed] [Article]
  31. Moore CL, Copel JA. Point-of-care ultrasonography. N Engl J Med. 2011 Feb;364(8):749–57.[PubMed][Article]
  32. AIDE-MEMOIRE for Diagnostic Imaging Services [Internet]. Geneva, Switzerland: Diagnostic Imaging and Laboratory Technology, World Health Organization; 2009 [cited 30 July 2021]. Available from: <http://apps.who.int/iris/bitstream/handle/10665/66695/a71903.pdf;jsessionid=587D9D11EB6508D1E00107BA345921C2?sequence=1>
  33. Wright AA, Katz IT. Beyond Burnout — Redesigning Care to Restore Meaning and Sanity for Physicians. N Engl J Med. 2018 Jan 24;378(4):309–11.[Article]
  34. Aravind Eye Hospitals -Wikipedia [Internet]. En.wikipedia.org. 2021 [cited 30 July 2021]. Available from: [https://en.wikipedia.org/wiki/Aravind\\_Eye\\_Hospitals](https://en.wikipedia.org/wiki/Aravind_Eye_Hospitals)
  35. Love RR, Paudel BD, Ahsan GMT, Ahamed SI. Symptoms in Nepali Patients with Incurable Cancers: Implications for Interventions. Indian J Palliat Care. 2020;26(4):476–8. [PubMed][Article]
  36. Love RR, Ahamed SI. Meeting the Global Abyss: A framework for Local Patient Centered Palliative Care. J Palliat Care Med. 2020;10:370.[Article]
  37. Love RR. Improving Cancer Outcomes In Low- and Middle-Income Countries. J Glob Oncol [Internet]. 2019 Nov 8;(5):1–3.[Article]
  38. Grimshaw JM, Russell IT. Effect of clinical guidelines on medical practice: a systematic review of rigorous evaluations. Lancet London, England. 1993 Nov;342(8883):1317–22. [PubMed] [Google Scholar]
  39. Love RR, Baum M, Love SM, Straus AM. Clinical practice to address tamoxifen nonadherence. Breast Cancer Res Treat. 2020 Dec;184(3):675–82.[PubMed] [Article]
  40. Kaplan RS, Haas DA, Warsh J. Adding Value by Talking More. N Engl J Med [Internet]. 2016 Nov 16;375(20):1918–20. [Article]
  41. Treatment by Cancer Type [Internet]. NCCN. 2021 [cited 30 July 2021]. Available from: [https://www.nccn.org/professionals/physician\\_gls/default.aspx](https://www.nccn.org/professionals/physician_gls/default.aspx)
  42. Government of Nepal, Ministry of Health, Department of Health Services, Management Division. National Treatment Protocol for common cancers in Nepal. Teku, Kathmandu; 2017.
  43. Gawande A, Lloyd J. The checklist manifesto. New York: Macmillan Audio, Metropolitan Books, H. Holt; 2009.
  44. Menachemi N, Collum TH. Benefits and drawbacks of electronic health record systems. Risk Manag Healthc Policy. 2011/05/11. 2011;4:47–55. [PubMed]
  45. Gawande A. The upgrade. The New Yorker. 2018;p:62-73. [Article]
  46. Mehl G, Labrique A. Prioritizing integrated mHealth strategies for universal health coverage. Science. 2014 Sep;345(6202):1284–7.[PubMed] [Article]
  47. Love RR, Alam KS, Arefin K, Ahamed S. The Core Information Tools for Palliative Care Symptom Management in Patients with Cancer. Nurs Prim Care. 2020;4(4):1–4.[Article]
  48. Bell D, Gachuhi N, Assefi N. Dynamic Clinical Algorithms: Digital Technology Can Transform Health Care Decision-Making. Am J Trop Med Hyg. 2018 Jan;98(1):9–14. [Article]
  49. Rudin RS, Bates DW, MacRae C. Accelerating Innovation in Health IT. N Engl J Med. 2016 Sep;375(9):815–7. [Article]
  50. Merson MH. University engagement in global health. N Engl J Med. 2014 May;370(18):1676–8.[PubMed] [Article]