The future of nursing
It is lamentable that it has taken a pandemic for the world to see nurses’ value to society, in terms of health and wealth. The World Health Assembly designated 2020 as International Year of the Nurse and Midwife. However, many events planned to showcase nursing did not go ahead because nurses worldwide had key roles responding to covid-19.

Yet the ensuing media coverage has given the public unique insight into the complexity of modern nursing beyond nostalgic stereotypes. Worldwide, we have seen nurses caring for ventilated patients, using technology to help families say goodbye to dying loved ones, leading and delivering testing and vaccination services, and holding governments to account by protesting for personal protective equipment.

Nurses are often the first healthcare professional a patient sees; many times they are the only ones. Without nurses, the sustainable development goals and universal health coverage are but mere aspiration.

The profession globally faces huge, evolving challenges, including substantial and worsening workforce shortages, chronic underinvestment, poor status and pay, and under-representation in decision making at the highest levels, where nurses can and do provide essential direction.

This collection of BMJ articles explores the evidence available to inform individual nurses, the profession, and policy makers as they reinvent nursing for a post-covid world, including practicable recommendations for ways forward. The collection, including open access fees, is funded by the World Innovation Summit for Health, a part of the Qatar Foundation. The BMJ peer reviewed, edited, and made the decisions to publish the work.

In addition to a scene setting introduction, articles focus on three crucial themes. Firstly, deep rooted gender based inequalities in the workforce. Some 90% of the world’s nurses are women. Retention of the current workforce and recruitment of more nurses, including more men, requires sustained investment and policy action in nursing education, leadership, and jobs.

Secondly, the profession must transition as digital technologies such as artificial intelligence become faster ingrained in society, health systems, and healthcare. How can nursing keep evolving to provide compassionate care in a digital world?

And thirdly, the profession has a crucial role in increasing its advocacy to minimise the considerable harms to health that anthropogenic climate change pose. Nurses are trusted and can create societal transformations at scale on behalf of the planet by speaking boldly and truthfully.

This collection starts a conversation that we hope encourages a bold vision of the future of the profession because nurses hold many of the solutions right now to strengthen our health systems for a post-covid world.

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How to reposition the nursing profession for a post-covid age

The pandemic has laid bare the need to invest in nursing for global health and economic security. **Howard Catton** and **Elizabeth Iro** outline how the profession must transform to maximize its effect on patient care and outcomes.

The effectiveness of healthcare is inextricably linked to the state of the nursing profession. The second report of the Independent Panel for Pandemic Preparedness and Response said, “The world was not prepared, and must do better,” arguing that “the covid-19 pandemic must be a catalyst for fundamental and systemic change in preparedness for future such events, from the local community right through to the highest international levels.”

Frailties in healthcare systems, exposed by the covid-19 pandemic, reinforce the urgent need for all governments to invest heavily in nursing to bring about such fundamental change.

In crisis situations, seizing opportunities to reflect, learn, and grow is critical. Countries have an opportunity to address the weaknesses that have been revealed in their healthcare systems and to ensure healthcare is available to everyone. The nursing profession must plan its next steps carefully to respond to the challenges the world now faces. The current context, and increased understanding of the state of nursing in the world, provides lessons that prompt consideration of nursing’s role and the form the profession should take in the future.

But these considerations must be viewed within a wider global context that includes gender equity and climate change as drivers of a new public health policy debate. And to reach universal health coverage by 2030 nurses must radically reframe their relationship with digital technology.

A bold vision of the profession can stimulate investment for the fundamentally changed healthcare services needed in the decades after the pandemic. Strengthening nurse education and leadership and including a nursing voice in all decisions about the future of health systems and policies, will be essential if we are to create more equitable services and better outcomes for patients and their communities.

**Year of the nurse, year of the pandemic**

The 72nd World Health Assembly designated 2020 as the international year of the nurse and the midwife. In April 2020 the World Health Organization, in partnership with the International Council of Nurses, (ICN), and the global Nursing Now campaign published *The State of the World’s Nursing 2020*. This report detailed the dimensions of the global nursing workforce and provided evidence based policy options to strengthen nursing education, jobs, and leadership.

Activities were planned worldwide throughout 2020 to raise the profile of the nursing and midwifery professions, showing their important contributions to population health, achieving universal health coverage, and society. However, many were put on hold as nurses responded to the covid-19 pandemic. It was hoped that the advocacy for the nursing role, coupled with a compelling case for investment in nursing, would encourage a new generation into the profession and mobilise strategic partners and financiers around the world to address the chronic nursing shortages that can limit service delivery and undermine patient care. It is also clear that investment is needed to support nurses who are struggling to cope mentally and physically with the consequences of the pandemic and exhausted from the demands of working under extreme pressure over a prolonged period.

Despite disruption of planned activities because of the pandemic, 2020 raised the profile of nurses and nursing work around the world. The global media focused on overcrowded hospitals, inadequate protective equipment for the workforce, and desperate personal stories of dedication and compassion—and the world clapped in support. The past year has taught us that applause is not enough. It is essential and urgent to invest in and protect all those who safeguard our health and security. The year 2021 is fittingly designated the year of health and care workers with the campaign slogan, “Invest. Protect. Together.”

**Nurses in top level leadership**

The pandemic has exposed the public to the realities of nursing: nurses’ advanced clinical skills, the complexity of their work, and their commitment to patient care. The public has also seen nursing’s frailties: too few nurses with the right skills and in the right place, insufficient plans to deal with a pandemic, and in many countries a lack of nursing leadership at government level to provide much needed direction.

Although nurses take on leadership at all levels, globally nursing is least represented at the highest level in governments and ministries of health. During the pandemic it has been normal to see chief medical officers speaking alongside government ministers but rare to see chief nursing officers doing the same. The State of the World’s Nursing 2020 indicated that only 70% of countries have a government chief nursing officer position; an ICN assessment found even fewer countries had a position with appropriate authority.
For health to be a central tenet of all policy making, nursing leaders must take their seats at tables in every arena where health systems and health policy decisions are directed and driven. Senior nurses have roles as enablers of health not just in health ministries, but in organizations and institutions tackling matters that affect health, including education, the environment, and the economy. For government and industry leaders to recognize the value of nursing input across multiple sectors, nurses at all levels must continue to engage in informed dialogue and debate on a range of global challenges.

WHO Global Strategic Directions for Nursing and Midwifery (2021-2025) will be presented for consideration at the 74th World Health Assembly in May 2021. It includes policy options to tackle current challenges and strengthen nursing leadership. Implementation would create stronger and resilient health systems better prepared for future adversities.

**Global shortage of nurses**

The *State of the World’s Nursing 2020* presented data from 191 countries. In 2018 there were almost 28 million nursing personnel; more than 19 million were classified as “professional nurses.” Nine out of 10 nurses globally are female, and one in six countries have fewer young nurses than nurses expected to retire within the next 10 years.

These 28 million nurses translate to a global nurse density of 36.9 per 10 000 population. This figure masks vast disparities in the distribution of nurses around the world. For example, there are 10 times more nurses per 10 000 population in the Americas than in the African region (83.4 v 8.7/10 000). In short, some of the poorest countries in the world have the fewest nurses.

The report highlighted a current global shortage of six million nursing jobs. A further 4.7 million nurses will be needed to replace those expected to retire over the next decade. Other analyses have identified a “covid-19 effect,” related to the mass traumatisation of the global nursing workforce, which could result in up to 10% of nurses (2-3 million) leaving their jobs once the pandemic work is done. In effect, much of the current nursing workforce could need to be replaced in the next decade, a gap that requires urgent action.

Up to 255 million people have lost their jobs during the pandemic, creating a pool of potential candidates to become the new nurses we need. ICN has called on governments to make available dedicated additional “health education and retraining opportunity” funding to support education providers to increase capacity and to support people who have lost jobs to move into the health and care workforce.

**Nurse migration**

The inequitable state of the global supply of nurses and migration has left many countries with too few nurses. Almost 90% of the six million shortfalls in nursing occurs in low and middle income countries. About one in eight, or 3.7 million, nurses are working in countries that are not where they were born or trained. In high income countries, foreign born or foreign trained nursing staff comprise 15% of the nursing workforce, compared with less than 2% in low income countries, many of which can ill afford to lose nurses.

ICN’s migration report underscored the importance of having data on international mobility and migration by nurses and advocated for transparency in terms of each country’s reliance on international nurses. The WHO global code of practice on the international recruitment of health personnel is widely recognized as the universal ethical framework that links the international recruitment of health workers and the strengthening of health systems.

In addition to full implementation of the code, ICN advocates that countries employing nurses from abroad follow ethical recruitment principles; ensure working conditions are compatible with individual nurses’ qualifications, skills, and experience; and provide family friendly contracts that allow nurses the freedom to return home or bring their families with them.

Nurse leaders should position themselves in government ministries, to lead changes that build in education and recruitment to foster greater self-sufficiency by making nursing a more desirable and valued career choice.

**Valuing nursing**

Nurses are valued especially for “being there” for the patient and their loved ones during life’s most challenging moments. This has continued throughout the pandemic, with nurses often standing in for loved ones while patients died, providing comfort and compassion in their last moments.

Traditionally, this kind of care and compassion is associated with love, an aspect of nursing that is important to people, particularly when they are struggling to deal with complex, long term, and terminal illnesses. Compassion is a key aspect of healing and can affect the delivery of quality health outcomes. Nursing with compassion places people at the centre of care, but nursing is much more than this: it is both an art and a science, requiring intelligence, skill, knowledge, and, most importantly, high quality education.

The pandemic has highlighted the need for countries to increase investments in the health workforce, including nursing. The economic and social value placed on what nurses do is deeply rooted in gender norms, including pervasive gender segregation of the nursing profession. The challenges surrounding workforce planning during the covid-19 pandemic have highlighted an urgent need for fair pay, decent and safe working conditions, and gender equity in health leadership opportunities. These types of expenditures should be considered integral to national health security.

As the demand for health services and nursing care continues to grow, having the right number of nurses with the right skills in every country in the world is an equity and health security imperative. Strategies to retain nurses and midwives, especially in rural, remote, and other underserved areas, are critical.

**Delivering and leading services**

Nurses’ clinical skills span a wide spectrum of health service delivery, including public health, health promotion, community care (tackling the social determinants of health), primary healthcare, hospital care, infection prevention and control, antimicrobial resistance, mental healthcare, emergency care, and care in humanitarian and disaster settings. Nurses not only care for the sick, they promote health and wellbeing. In some parts of the world nurses are often the first, and sometimes only, healthcare workers that people have access to. After patients have had medical interventions, often using high-tech equipment in hospitals, nurses’ clinical competency is crucial because every member of the healthcare team is equally responsible and must provide an equally high level of care.

In many countries, nursing professionals have the main responsibility for immunisation programmes, and in some countries they are entirely responsible. With the covid-19 pandemic, nurses are participating in what will be the biggest immunisation event in history, with
billions of doses administered in diverse locations worldwide. Many challenges are becoming evident, including supply chains, distribution problems, training, health education of the general public, availability of facilities and equipment for immunisation, the number of available vaccinators, misinformation, mistrust, and vaccine hesitancy. Coordinating valued and trusted nurse professionals to deliver on this task will move us closer to ending the acute phase of this pandemic.

At the clinical level, advanced nurse practitioners worldwide provide quality, cost-effective care close to people’s homes, and these sorts of services can help to reshape the healthcare of the future. Advanced nurse practitioners create a huge opportunity to develop and grow strong health systems. They have a leading role to play in the prevention and containment of diseases, as well as in providing first contact and long-term care, while benefiting vulnerable groups that other healthcare professionals may not reach.

However, some countries have regulatory restrictions that prohibit the potential expansion of the advanced nurse practitioner role. The ICN published its advanced nurse practitioner guidelines to support country-led approaches for advanced nursing practice that is safe, efficient, effective, and cost-effective. Leadership by advanced practice nurses can help ensure nurses work to their full potential by designing and implementing nurse-led services.

**Universal health coverage and inequalities**

Achieving universal health coverage will require nurses to be involved in effective planning of primary healthcare services and strategic management of healthcare delivery. Much of the mortality burden for COVID-19 has been borne by people with existing vulnerabilities, especially preventable comorbidities, and often within communities already at high risk of communicable and non-communicable diseases. Tackling these inequalities falls firmly within the scope of nursing, and nurses need to be enabled, through high-quality education, safe and supportive workplaces, effective leadership, and collaboration in multidisciplinary teams to fulfil this element of their practice.

Optimizing the contributions of nurses to universal health coverage through evidence-based policy approaches is a clear priority for countries around the world.

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How to attain gender equality in nursing—an essay

Tackling stereotypes and assumptions that deter men from nursing is essential to meet the growing shortage of nurses and improve diversity, say Thomas Kearns and Paul Mahon

The covid-19 pandemic shows that where, when, how, and to whom care is delivered has never been more diverse. In today’s healthcare, the people delivering care must be similarly diverse, for the benefit of the profession, its practitioners, and patients.1-3 Yet around 90% of the world’s nurses are women.4 Calls are being made, as they have before, to examine ways to promote the profession among men to tackle this imbalance.5-7

Nursing is an inherently human experience: it is done for humans, by humans, and as humans, and in human experience no one gender claims primacy. Men have had, and continue to have, a valuable contribution to make to nursing, not simply because they are male but because they are human. Men enter the profession for the same reason as women—to care for people.

Huge shortage

Nurses are often the first, and sometimes the only, healthcare provider that a patient sees,6 making them well positioned to respond to healthcare challenges at every level. One of the key challenges affecting the achievement of the sustainable development goals of health and wellbeing,5 is the worldwide shortage of nurses. Recruiting more men is essential to tackle this shortage.

The world faces a deficit of 13.5 million nurses in the next decade.8,9 In its first report on the state of the world’s nursing,10 the World Health Organization estimated that an additional six million nurses will be needed by 2030. This is a 20% increase from the current total global nursing stock of 27.9 million. In addition, the burden of anticipated retirement over the next decade means that 4.7 million new nurses must be recruited just to maintain current staffing levels.6 It is too early to say what effect the covid-19 pandemic will have on intention to join the profession, but initial estimates are that at least a further 10% will leave.9 Data to monitor the effect of covid-19 on recruitment and retention of nurses will be vital.

Recent changes in society, healthcare globally, and nursing have seen more men entering the profession. In general, their number varies across regions (table 1) and remains stubbornly low in some countries and clinical specialties such as obstetrics.10

The reasons for this are unclear but may include cultural perceptions of the role of men and women in society, the status of nursing itself, or the pay and conditions of nurses. For example, a higher proportion of male nurses in some countries may reflect societal perceptions of the role of women, and vice versa. Further research into this area may provide useful insights into gender equity for all.

Why are men under-represented?

Contrary to the common perception that male nurses are a relatively recent phenomenon, men in nursing can be traced to 1600BC (box 1).11 History speaks of military and religious orders such as the Parabalani (“those who disregard their lives”)—a group of men who cared for people with leprosy in Alexandria in AD416, or St Camillus de Lellis, who in AD1535 vowed to care for sick and dying people.5-12 The Maltese cross, a symbol of humanitarianism worn by the Knights Hospitaller in 1099, was subsequently adopted by the Nightingale School of Nursing in London.13

By the mid-1800s as men fought and died during the Crimean, American civil, and other wars, more women became nurses. In the years after the introduction of the epochal Nightingale reforms, men were increasingly excluded from formal nurse education and eventually were barred from the English general register.11-15

Combined with the gender based division of labor, and Victorian righteousness regarding the place of women in society,16-18 the feminization of caring within the hierarchical male dominated medical model meant men wishing to do the dirty “women’s work” were classified as deviant, undesirable, or unable to get a “real man’s” job. As caring became devalued, more men were forced to find occupations with better pay so they could provide for their families.19

The decline of the male nurse is a complex product of cultural, historical, economic, and political factors. In modern times, the move from the hospital based apprenticeship model of education to the tertiary setting has helped establish nursing as a profession. But rising entry requirements have not been accompanied by a corresponding increase in remuneration, making nursing a less attractive career option for men and women. In addition, gendered and inaccurate representations of nursing and male nurses limit the public’s perception and affect the recruitment and retention of men.20-22

Men in the profession have also experienced stigmatization and have been disparately positioned as being both dominant and dominated, victimized and valorized, and of benefiting from the hidden advantages of status shield and status bonus that their gender affords.20-22

Studies show that adverse stereotypes affect male nurses’ physical and emotional wellbeing, resulting in depression, demotivation, and in some cases their exit from the profession.23 The perpetuation of such stereotypes and gender based labels injures the profession, preserves segregation, and stifles the pursuance of gender equality for all.1,6-22 Moreover, they compound the shortage of nurses, limit diversity in the workplace, and deny patients of both genders a holistic caring environment.15-21

What can be done?

Increasing the number of men in nursing is seen as difficult because of the erroneous perception that nursing is a female-only profession, sexist stereotypes of the male nurse being less masculine,11,13-16 and nurses’ undervalued status and pay. Solutions are as complex as the genesis of the 200 year decline of men in nursing. There is no quick fix, and change requires political, sociocultural, and professional action. Although some solutions will be universal, ultimately each country and culture will have to determine what works best for them. Nurse leaders and politicians should offer long term, strategic solutions beyond mere marketing campaigns.3

Better public understanding

That is not to say that marketing is not needed. Indeed, given the publicity afforded to the profession during the pandemic, now is an ideal time to set aside the nostalgic view of nursing’ and capitalize on a contemporary civic conception of caring, competence, and capability throughout clinical settings from community to critical care.

The public has seen nurses caring for ventilated patients, using tablet computers so that family members could say goodbye to loved ones, leading covid testing centres, and innovating in practice. We have heard
Nursing Now have raised the status and understanding of nursing itself. Understanding, not just of men in nursing, but of career could promote a more realistic profile of nursing, and this momentum must be maintained. As part of this, we must de-gender and revalue caring by attaining a gender balance and by continuing to advocate for better pay and conditions for nurses.25

Better recruitment
Men enter and stay in nursing for many of the same reasons as women, and ultimately, they do so to care for patients.24 Therefore, recruitment strategies that dispel the myths surrounding the male nurse while promoting the inherent values of nursing are needed.10 We can look to countries with higher percentages of male nurses for direction. For men becoming nurses mid-career, graduate entry should be an option—not just in terms of access to a place on the program but also with financial support to facilitate the uptake of that place. As countries seek to increase the number of nursing graduates, consideration could also be given to a specific allocation of places to male applicants to show that men are both missing and needed in nursing.17 Many male nurse societies were established in the mid-1800s, and such social supports, including the provision of male role models, will help retain men in the profession.

More financial investment
WHO recommends that nursing education be considered a science subject.6 Therefore, nursing should be afforded the status, pay, and benefits of other science and technology professions. For example, a senior staff nurse (a nurse with over 20 years’ experience) in Ireland earns just under €50 000 (£43 000; $61 000) in base pay a year whereas a pharmacist earns the same after seven years and up to €67 000 after 13 years.26 Adequate pay and acceptable working conditions, mobility, and opportunity for personal and professional advancement must

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Table 1 | Percentage of male nurses worldwide*

<table>
<thead>
<tr>
<th>Region</th>
<th>Regional mean (%)</th>
<th>Range among countries (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African region</td>
<td>38</td>
<td>8–90</td>
</tr>
<tr>
<td>American region</td>
<td>12</td>
<td>2–24</td>
</tr>
<tr>
<td>Eastern Mediterranean region</td>
<td>26</td>
<td>9–56</td>
</tr>
<tr>
<td>European region</td>
<td>11</td>
<td>0–32</td>
</tr>
<tr>
<td>South-east Asia region</td>
<td>18</td>
<td>0–62</td>
</tr>
<tr>
<td>Western-Pacific region</td>
<td>18</td>
<td>2–40</td>
</tr>
</tbody>
</table>

*National Health Workforce Data Portal (https://apps.who.int/nhwaportal/Home/Index). Year of data varies by country from 2009 to 2019

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Stories of nurses’ adaptability, resilience, determination, camaraderie, and composure. We have seen them hold patients’ hands and hold governments to account while fighting for proper personal protective equipment. This has given the public a better insight into the art and science of caring in modern healthcare, which we can build on to attract more men, and women, to the profession.

Neither patients nor the public fully understand the complexity of nurses’ work.3 Highlighting nurses’ roles across domains of practice, registration status, and stage of career could promote a more realistic understanding, not just of men in nursing but of nursing itself.24 Campaigns such as Nursing Now have raised the status and profile of nursing, and this momentum must be maintained. As part of this, we must de-gender and revalue caring by attaining a gender balance and by continuing to advocate for better pay and conditions for nurses.25

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Box 1: Brief history of men in nursing

- **250BC:** First nursing school in the world started in India. Only men were considered “pure” enough to become nurses11 12
- **AD416-18:** The Theodosian codes refer to the Parabolani—a group of 500 poor men who cared for the lepers of Alexandria13 14
- **1095:** Order of the Brothers of St Anthony founded (merged with the Knights of Malta in 1775) to care for people inflicted with the medieval disease of St Anthony’s fire15 16
- **1099:** St John Hospitallers of St John of Jerusalem founded to care for sick and injured pilgrims en route to and from the Holy Land13 15
- **1119:** Order of Saint Lazarus of Jerusalem founded
- **1180:** Order of the Hospitallers of the Holy Spirit and the Brotherhood of the Holy Spirit founded
- **1192:** Order of Brothers of the German House of Saint Mary in Jerusalem, or the Teutonic Knights, founded
- **1334:** The Beghards (renamed Alexian Brothers after Saint Alexis in 1469) cared for the poor, the lepers, and the “morons and lunatics” of Europe14 16
- **1535:** St John of God began studying under the monks of St Jerome and cared for the ill and mistreated
- **1585:** St Camillus de Lellis became a priest and established a religious order, vowing to care for the sick and dying even with danger to his own life
- **1600s–1700s:** Protestant reformation led to the closure of monasteries and convents across Europe resulting in a loss of records of organized nursing activity14 16
- **1780s:** Nurse James Durham (or Derham) became the first African American in the United States to practise medicine12
- **1850–1950s:** War began to alter nursing, and the role of men within it
- **1859:** Florence Nightingale publishes Notes on Nursing, suggesting “every woman is a nurse”
- **1861–65:** American civil war: more women became nurses in civilian life12
- **1877:** The Nurses Act in England barred men from entering the general register.5 11 14 15 Internationally, men found it difficult to access formal training and education2 17
- **1884:** St John Ambulance Association founded (derived from the Knight Hospitallers)
- **1888–1914:** Alexian Brothers and other orders built hospitals throughout Chicago, Connecticut, Massachusetts, Missouri, New York, and Pennsylvania. Increasingly, men became nurses at their own social peril, experiencing discrimination, pay inequality, role erosion, and exclusion from formal nurse education12
- **1914–18:** American men were prohibited from practising in the US Army Nursing Corps
- **1919:** The Nurses Act in England barred men from entering the general register.5 11 14 35 Internationally, men found it difficult to access formal training and where they did, their training was shorter and lacked the curricular content of their female counterparts15
- **1937:** Society of Registered Male Nurses founded
- **1950s:** Men begin to be recognized in nursing in the US, Czechoslovakia, the UK,2 14 and towards the 1970s, in Denmark and Sweden15
- **1971:** American Assembly for Men in Nursing founded

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underpin and be highlighted in recruitment and retention initiatives.

Confrontation of stereotypes

Stereotypical assumptions must be challenged at school and societal level in careers guidance, mainstream and social media, and popular culture so that boys know that nursing is a valid career option. This will require greater intersectoral and cross government collaboration from the early years to higher education levels, and for broadcasters to consider how their programming may negatively portray nursing and male nurses. We must robustly voice our objection to any outdated overtures that disenfranchise the profession and the people within it. We must also promote professional acceptance and challenge stereotypes and assumptions in the profession itself—such as those in relation to male nurses’ sexuality, ability to care, or reasons for entering the profession. For example, the literature often refers to the “hidden advantage” of male nurses and the over-representation of men in leadership positions without examining broadly why this is so.

Although there may be many individual and institutional reasons for this “glass elevator,” including conscious and unconscious bias, hegemonic masculinity, explicit or tacit discrimination, continuity of employment, organizational generating practices, or the personal and professional characteristics of the individual nurse, such discussion conflates the problem of attracting men to the profession with the career progression of all nurses. Indeed, examining ways to empower all nurses through initiatives such as the International Council of Nurses’ global nurse consultants initiative will help improve health, promote gender equality, and support economic growth.  

To increase the number of men in nursing, it is important to highlight to men their historical past and their potential future in a rewarding, contemporary career with myriad clinical, academic, and professional development opportunities. The profession must continue to lobby governments to move beyond mere platitudes and actually provide parity of pay and esteem. We must portray to the public the true scope and complexity of our professional practice, and we must build a profession for all through robust policy that focuses on education, jobs, practice, and leadership.

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How the nursing profession should adapt for a digital future

Transformation into a digitally enabled profession will maximize the benefits to patient care, write Richard Booth and colleagues

Digital technologies increasingly affect nursing globally. Examples include the growing presence of artificial intelligence (AI) and robotic systems; society’s reliance on mobile, internet, and social media; and increasing dependence on telehealth and other virtual models of care, particularly in response to the COVID-19 pandemic.

Despite substantial advances to date, challenges in nursing’s use of digital technology persist. A perennial concern is that nurses have generally not kept pace with rapid changes in digital technologies and their impact on society. This limits the potential benefits they bring to nursing practice and patient care. To respond to these challenges and prepare for the future, nursing must begin immediate transformation into a digitally enabled profession that can respond to the complex global challenges facing health systems and society.

Many exemplars show how digital technologies already bring benefit to nursing practice and education.1 For instance, telehealth programs where nurses provide daily monitoring, coaching, and triage of patients with several chronic diseases have helped reduce emergency department admissions.7 Mobile devices, in particular smartphones and health applications, are enabling nurses to offer remote advice on pain management to adolescent patients with cancer and supplement aspects of nursing education by providing innovative pedagogical solutions for content delivery and remote learning opportunities.5

The development and application to nursing of systems based on AI are still in their infancy. But preliminary evidence suggests virtual chatbots could play a part in streamlining communication with patients, and robots could increase the emotional and social support patients receive from nurses, while acknowledging inherent challenges such as data privacy, ethics, and cost effectiveness.6

Challenges persist

Digital technologies may, however, be viewed as a distraction from, or an unwelcome intrusion into, the hands-on caring role and therapeutic relationships that nurses have with patients and families.7 This purported incompatibility with traditional nursing ideals, such as compassionate care, may explain some nurses’ reluctance to adopt digital approaches to healthcare.8,9 In addition, nursing’s history was as structurally subordinate to other healthcare disciplines,10 and the profession is still cementing its relationship and leadership in health systems.

The specialty of nursing informatics has long advocated for the integration of technology to support the profession, but it has comparatively few practitioners globally. Nursing informaticians are predominantly based in the United States, where the discipline seems to have originated, but many other countries and regions are expanding their digital nursing workforce and involvement with informatics.11,12 Slow progress in some areas has been due to a lack of leadership and investment that supports nurses to champion and lead digital health initiatives. Globally, uncertainty remains regarding the next steps the nursing profession should take to increase and optimize its use of digital technology. This challenge is exacerbated by the global diversity of the profession, including unequal access to resources such as technological infrastructure maturity and expertise. Huge differences exist among countries and regions of the world in terms of the digitalization of healthcare processes, access to internet connectivity, and transparency of health information processes.

Selected technologies: benefits and challenges

The nursing literature contains many analyses of digital technologies used to support or extend the profession, including practice (eg, hospital information systems, electronic health records, monitoring systems, decision support, telehealth); education (eg, e-Learning, virtual reality, serious games); and, rehabilitative and personalized healthcare approaches (eg, assistive devices sensors, ambient assisted living).1

Table 1 summarizes the potential benefits, challenges, and implications of emerging innovations to practice.

The table is not exhaustive, but the diversity of topics researched shows the profession recognizes the value and challenges of digital technologies. Given the evidence, for the profession to make further progress we recommend five areas for focused and immediate action. These recommendations should be qualified in light of regional context and professional background owing to global heterogeneity in nursing and the inclusion of digital technologies into healthcare.

Reform nursing education

We must urgently create educational opportunities at undergraduate and graduate levels in informatics, digital health, co-design, implementation science, and data science.17 These should include opportunities to work with and learn from computing, engineering, and other interdisciplinary...
colleagues. For instance, nursing will need a critical mass of practitioners who understand how to use data science to inform the creation of nursing knowledge to support practice. These practitioners will also need savviness and courage to lead the development of new models of patient care enabled by digital technologies.

Determining how, where, and why technology like AI should be used to support practice is of immediate interest and a growing competency requirement in health sciences and informatics education. Nursing education should evolve its competencies and curriculums proactively for the increasing use of digital technologies in all areas of practice while incorporating novel pedagogical approaches—for example, immersive technologies such as virtual and augmented reality—to deliver aspects of simulation based education.

Recently, the American Association of Colleges of Nursing released core competencies for nursing education, explicitly identifying informatics, social media, and emergent technologies and their impact on decision making and quality as critical to professional practice.

### Build nursing leadership in digital health

All levels of nursing leadership must advocate more actively for, and invest resources in, a profession that is both complemented and extended by digital technology. The profession needs to evolve its use of digital technology by continuing to champion and support nurses to become knowledgeable in, and generate new scientific knowledge...
The increasing presence and recognition of the importance of chief nursing informatics officers is a step in the right direction. Further, providing opportunities for nurses of all specialties to contribute to the development and implementation of digital health policies, locally and nationally, could increase future use of digital technologies in nursing.

**Investigate artificial intelligence in nursing practice**

The influence of AI on human decision making and labor are areas in need of immediate inquiry to support nursing practice for the next decade and beyond. AI technologies could provide the profession with huge benefits in data analytics and advanced clinical decision support.

Although many of the purported potential benefits of AI (eg, improved patient outcomes, streamlined workflow, improved efficiency) have yet to be fully shown in nursing research, it is inevitable that AI technologies will be used more regularly to support and extend nurses’ cognitive, decision making, and potentially labor functions.

These opportunities bring new and dynamic practice considerations for nursing and interprofessional expertise. One example relates to the potential automation of inequity and injustice within systems and decision support tools containing AI: self-evolving algorithms in systems sometimes unintentionally reinforce systemic inequities found in society.

Increased use of AI also brings novel policy, regulatory, legal, and ethical implications to the fore. The nursing profession must examine its role, processes, and knowledge against emerging ethical frameworks that explore the opportunities and risks that AI and similar innovations bring, while advocating for patient involvement in AI development and application. Florida and colleagues offer tenets regarding AI development and the ethical considerations in using such innovations in their call to develop AI technology that “secures people’s trust, serves the public interest, and strengthens shared social responsibility.” They also advocate that as guiding principles, AI should be used to enhance human agency, increase societal capacities, cultivate societal cohesion, and enable human self-realization, with an emphasis on instilling and reinforcing human dignity. Further research, funding, and thought leadership in this domain are needed to help support the development of new practice policy, regulatory frameworks, and ethical guidelines to guide nursing practice.

**Re-envision nurse-patient relationships**

The profession must reframe how nurses interact with and for patients in a digital world. The sheer variety of “do-it-yourself” health and wellness applications (eg, personalized genetic testing services, virtual mental health support), mobile and social media applications (eg, mHealth, wearables, online communities of practice) and virtual healthcare (eg, telemedicine, virtual consultations) options available to consumers is impressive.

All this may seem antithetical toward the traditionally espoused nursing role—therapeutic relationships in physical interactions—but patients are increasingly empowered, connected to the internet, and demanding personalized or self-management healthcare models that fit their busy and varied lifestyles.

To maximize its impact on patient care, the profession should continue to develop virtual care modalities that exploit internet and mobile technology, drawing on its experiences with telehealth and remote models of care. These care models might also be extended through virtual or augmented reality technologies or integrated with assisted living or “smart home” systems, and potentially other precision and personalized healthcare solutions that leverage genomic and other biometric data.

Care approaches, interpretations of privacy, and technological interoperability functionalities should be co-designed among the interprofessional healthcare team, patients, and carers and available where patients want them, ideally in both physical and digital realms. Deeper discussions and scientific research regarding access, cost, electronic resource use or wastage, and equity implications of the increasing digitalization of nurse-patient relationships will also need to be thoroughly explored.

**Embrace digital practice**

The profession requires a cultural shift. Its membership and leadership must demand the evolution of digital systems better to meet contemporary and emerging needs.

Too often, technology to support nursing is poorly configured, resourced, or not upgraded to respond to practice and societal trends. Nurses still commonly use practice systems that are lacking basic usability (eg, contributing to alert fatigue, reinforcing disruptive workflow processes) or generate added documentation burdens because of poor configuration and optimization.

There is huge variation globally in access to, integration of, and sustainability of digital technology. Solutions vary and are context specific. Renewed awareness of digital technology’s use brought about by the covid-19 pandemic offers an impetus for change that nurses should embrace.

Tasks undertaken by nurses that do not add enough value to patient care present opportunities for partial or full divestment, and may be better integrated into future technology enabled processes or delivered by other care providers.

The profession should revisit cultural interpretations of how technology such as drones, robots, and other AI enabled systems can be considered complementary to nursing practice and process, rather than as competition or adversaries. Collaboration with technology developers, providers, and patients will be essential to ensure success.

Although some outdated nursing activities and processes made redundant or less relevant will likely be missed by some in the profession, digital technology provides opportunities to support new models of care and approaches to nursing practice. We must not allow cultural and historical interpretations of nursing to upend or impede progress.

**How nursing can stay relevant**

Nurses entering the profession today will undoubtedly witness substantive disruption and change from digital technology by the time they are mid-career. Without
immediate action, the nursing profession stands to miss a remarkable opportunity to generate new roles, knowledge, and relationships within future health systems and societies saturated by digital technologies.

Nursing will continue to offer value and importance to healthcare systems in the coming decades. However, the profession must consider its role, knowledge, and relationships with technologies and patients to remain relevant in digitally enabled societies and healthcare systems and continue to provide compassionate care in a digital world. Without proactive strategic self-reflection, planning, and action, nursing will fail to control its trajectory across the chasm separating the past, present, and future of practice.

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Nursing’s pivotal role in global climate action

Nurses moved early and eagerly to advocate action to resist climate change and are well positioned to achieve much more. Patricia Butterfield, Jeanne Leffers, and Maribel Díaz Vásquez urge nurses to act boldly within and across professional boundaries.

Climate change threatens the very foundations of human health and existence. The planet has warmed more than 1.2°C compared with preindustrial levels, precipitating profound and rapidly worsening health effects on every continent. Despite overwhelming evidence, however, the global response to climate change has been mired in political intransigence and bureaucracy. Health professionals have been increasingly looked to for leadership, and their sustained commitment is dealing with critical gaps in climate science, policy, and advocacy.

The nursing profession came to the climate debate early (box 1) and is well positioned to expand its role. Nurses have three essential assets. Firstly, they comprise about 60% of health professionals (medical doctors, nurses, midwives, dentists, and pharmacists) worldwide, working in many clinical and public health sectors. Their collective potential to change the trajectory of climate action is unparalleled.

Secondly, nurses are trusted. The US based Gallup poll, in which nurses were ranked as the most trusted profession for the past 19 years, is often cited, but is far from unique. The UK focused Ipsos Veracity Index shows that nurses ranked number 1 among 30 professional groups. Doctors, engineers, and teachers also fared well, but nurses are generally perceived as being accessible and responsive to the needs of others.

Nurse are often the first health provider that people meet when they are seeking care. Nursing has immense potential to create and disseminate messages about the climate that are acceptable to those who are doubtful about climate change.

Thirdly, nurses are close to the people most vulnerable to climate change. Many nurses work for people who are underserved or marginalized, or both. Nurse staffing numbers have been associated with reduced mortality from climate sensitive diseases such as malaria, dengue fever, and schistosomiasis. In a recent analysis of mortality data from 53 sub-Saharan African countries, the staffing levels of nurses and midwives were found to be the strongest predictor of lower covid-19 deaths.

In unstable places, the presence of nurses makes a difference. Imagine the possibilities if the scope of nursing worldwide was expanded to include actions dealing with climate change.

An unprecedented challenge

Through grit and mutual support, nursing has built a solid body of work operationalizing climate action (box 1). Unfortunately, we know these efforts are not enough. As the Lancet Countdown starkly noted, “An unprecedented challenge demands an unprecedented response, and it will take the work of the 7.5 billion people currently alive to ensure that the health of a child born today is not defined by a changing climate.”

The current pandemic provides further validation that “creating a healthier, fairer, and greener world” will be needed to resuscitate economies hit by the effects of covid-19. The International Council of Nurses has noted that covid-19 has forced the world to pause and take stock of opportunities to benefit the planet, stating “It may be the only chance we have for anything positive to come out of the covid-19 pandemic, and to let this opportunity slip by would be unforgivable.” In this context, we offer five recommendations.

Leapfrog nurses into leadership roles

Accelerate change by leapfrogging nurses into leadership roles. Several initiatives have focused on moving nurses into executive level leadership roles. These programs assume that healthcare will improve if nurses are at the table, rather than in roles remote from power.

Several initiatives of the global Nursing Now campaign, championed by the UK charity the Burdett Trust for Nursing, have focused on gender disparities, noting that although women comprise 70% of the healthcare workforce, they represent only 25% of leadership roles. Due to complete its work this year, Nursing Now shows what will be needed to increase nurses’ leadership capacity. Realizing the potential of nurses as climate action leaders will require thorough coaching in project design. Leadership programs for climate action are needed for nurses worldwide; such efforts should allow protégés and mentors to work together.

The International Council of Nurses, with its familiarity with the nursing workforce and environmental health, is well equipped to champion tactical goals in this area. Additionally, for far too long work on climate change carried out by nurses in hospitals and academia has gone uncompensated. The longstanding practice of expecting nurses to “help” with climate projects—that is, to donate their time with inadequate recognition, needs to end.

Give nurses the right skills

Give nurses and students the skills they need to create the future. Nurses in clinical practice have great potential to enact climate protective actions; providing resources for them should be a top priority for the profession. Practicing nurses understand the organizational lay of the land; they often have new ideas for projects and have coped with organizational barriers. To be successful they will need basic training in environmental health problems, a modest project budget, and ongoing professional mentoring.

Fortunately, for professional development the news is good. New resources are being released daily. Information is available from sources such as the Climate Change and Health program (at the MGH Institute of Health Professions), the Global Consortium on Climate and Health Education, and Project ECHO’s Climate and Health series. These groups provide basic resources to others, including webinars, online courses, syllabi, and case studies (box 2). Of note is the Nigeria based GalesActGreen initiative, which focuses on building a network of climate literate nurses to serve as agents for change throughout Africa. These recent advancements are cause for celebration.

The development of curricular resources, guides, and tools has been a strong suit for nursing. Most developments have
been aimed at normalizing climate actions within nursing practice. Among existing resources, the NurSuS Toolkit, which focuses on sustainability, is most easily scalable globally.11 Environmental sustainability and stewardship need to be taught so that nurses and students not only understand but also have the ability to initiate change. Two other cross-cutting topics are imperative: risk communication and public health systems thinking; both receive inadequate attention in undergraduate and graduate programs.

We recommend a strong curricular pivot towards risk communication; many nurses receive too much content (often antiquated) on therapeutic communication. In contrast, risk communication focuses on applying science based information to health events in order to promote informed decision making. Messages from nurses about climate action are stronger when they are framed in risk communication vernacular.

As for risk communication, nurses’ skills in dealing with public health systems need to be improved and focus on action rather than description. Recent pedagogical work, conducted under the auspices of planetary health and sustainable development, emphasizes the importance of interdependent ecosystems and global inclusivity; both are fundamental to an understanding of public health systems.15-18 Making these proposed changes standard in nursing curriculums will not only increase nursing’s leadership capacity, but will also make nursing boards and licensing councils take notice and reconsider the importance of knowledge of fundamental climate change as a prerequisite for licensure.

**Promote activism and advocacy**

Rekindle activism, advocacy, and relentless truth telling. In August 2018 Greta Thunberg began protesting in front of the Swedish parliament, holding a sign that read “Skolstrejk för Klimatet” (school strike for climate). The pace at which she amplified the global response to climate change was exceptional. Her solemn indignation is emblematic of a new generation of environmental activists,15 who believe that
climate deniers should not be placated; antiscience groups should be exposed. Nurses in the UK and elsewhere have found resonance with this approach to activism, urging their employers to adopt ambitious policies to tackle environmental sustainability.\textsuperscript{16} Activism can take many forms, including protests, petitions, and political engagement (including running for office). Nursing should not be shy about using its voice for change.

Advocacy is fundamental to change in systems and structures.\textsuperscript{17–19} Alliances such as the UK Health Alliance on Climate Change and the Global Climate and Health Alliance typify strong interprofessional efforts focused on policy advancement.

In addition to taking on interprofessional work, nurses have also recognized that speaking the truth also means critically examining their own healthcare practices. Acknowledging responsibility for climate change has led to the development of initiatives such as the Nurses Climate Challenge (focused on climate education) and the Nurses Drawdown (focused specifically on greenhouse gas emission); such efforts represent effective conduits for collective action.\textsuperscript{15, 20–21}

**Think global**

Assure a global viewpoint by removing Western bias from nursing’s agenda for climate action.

The phrase “while we are in the same storm, we are not in the same boat” serves as a poignant framing device for both Covid-19 and climate change. For example, we know that small island developing

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**Box 3: How to achieve the recommendations**

**Accelerate change by leapingfrogs nurses into leadership roles**
- Employ recent international initiatives that can move nurses into executive level leadership roles
- Foster representation of nurses on international and national boards, congresses, governmental panels, and delegations as high level decision makers
- Build partnerships among nursing organizations globally to strengthen the power of the profession
- Amplify leadership in sustainable healthcare initiatives in the workplace and community
- Pay for nurses’ climate change work

**Give nurses and nursing students the skills they need to create the future**
- Mandate that the national nursing education curriculum and accrediting bodies include climate change content and action plans into graduate and professional development education
- Clarify the effects of climate change on health in the clinical practice requirements of boards of registration and national licensing councils
- Integrate sustainability literacy and action into pre-licensure and professional nursing education using tools such as the NurSuS toolkit
- Develop educational strategies for nursing advocacy skills that include risk communication and systems level approaches to problem solving for climate change
- Integrate planetary health, social determinants, health equity and lifespan, occupational and location specific vulnerabilities into nursing climate change education
- Ensure that education reinforces the responsibility of nurses to educate individuals, families, and communities to deal with mitigation, adaptation, and resilience strategies
- Disseminate models, programs, and strategies of collaborative educational initiatives such as the Global Consortium on Climate and Health Education

**Rekindle activism, advocacy, and relentless truth telling**
- Amplify the voice of nurses to reach healthcare professionals, patients, families, and communities
- Extend the effectiveness of nursing by speaking truth to power to mitigate the effect of climate change on health
- Influence others by showing personal commitment to sustainable living choices using strategies promoted by Nurses Drawdown.org
- Bolster organizations to develop national action plans for mitigation, adaptation, and resilience strategies
- Advocate increases in funding and support for nursing research to build evidence for climate change strategies that improve health
- Seek to communicate with national leadership to end subsidies or other support to monoculture systems that harm biodiversity
- Advocate enforcement of regulations of air and water quality standards that protect communities from harmful effects of climate change

**Ensure a global lens by extinguishing Western biases in the climate action agenda of nursing**
- Promote a stronger voice from nurses in low and middle income countries in the international climate action agenda
- Adopt the successful climate change strategies developed in low and middle income countries as models for countries across the globe
- Rescue and make visible the ancestral knowledge and practices in the face of climate change
- Deal with the effects experienced by those living in low and middle income countries, such as extreme heat, drought, extreme weather events, rise in sea level, wild fires, and indoor cooking stoves, to improve health
- Extend the Nurses Climate Challenge to reach nurses in countries across the globe

**Put equity, justice, and morality front and centre**
- Call for health equity agendas to be central to climate actions
- Aim to achieve the sustainable development goals for all nations
- Value ecosystems to protect biodiversity
- Endorse an intercultural approach in indigenous areas to guarantee the right to health and a healthy environment
- Respond to the call of Laudato Si’ to recognize the role of climate change in the lives of all people on earth, with disproportionate effect on the poor
- Expose corporate greed and governmental corruption as primary causes of climate change
- Advocate healthy communities to assure active transportation, green energy, and healthy, sustainable food options for all
states are disproportionately vulnerable to the direct and indirect effects of climate change. To date, however, the voices of nurses in highly affected communities have received far less attention than those from Western nations.

Nursing should strengthen its commitment to indigenous practices, and ancestral knowledge that is climate protective. Nursing’s climate action stance can change from that of a white and wealthy world to one that is more inclusive.

The wisdom of nurses in low and middle income countries needs to be incorporated into the global climate discourse; their work ranges from subjects as diverse as the response to megafires in the Amazon to the promotion of low emission cooking stoves that safeguard respiratory health. The United Nations sustainable development agenda (inclusive of 17 sustainable development goals) exemplifies a more inclusive approach to change. Key stakeholders, including the International Council of Nurses, are prioritizing the climate action needs of high risk countries. Nursing organizations are beginning to reflect regional (eg, Pan American) strengths and international viewpoints.

Climate change is a moral problem

Make equity, justice, and, yes, morality, front and centre. The convergence of the climate action and health equity agendas has been accelerated by the covid-19 pandemic, reflecting the all too obvious truth that while the rich have the means to escape many forms of tragedy, the poor are stuck.

Astute leaders are blaming corporate greed and governmental corruption as causes of climate change. Theologians have been effective in reminding us that climate change fundamentally represents theft of the world’s assets from future generations. Pope Francis’s 2015 encyclical notes that many of those who “have more resources and economic or political power seem to concentrate mainly in masking the problems.”

Nurses can be more effective bearers of the moral story of climate change. We have a legacy of protecting human dignity. The public is comfortable with nurses talking about right and wrong. We should not hesitate to discuss the rights of future generations, vulnerable groups, and indigenous peoples. We should form partnerships with colleagues in public health, medicine, and behavioural health, accept challenges, and seek responsibility.

What did you do?

“What the future will ask, what did you do?” is a succinct and startling provocation that reminds us what is at stake for us and our children. Much needs to be done, and quickly (Box 3). By building on what we have done, and more importantly, who we are, nursing has both the skills and the mindset to meet the moment.

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