Global health research is multifaceted. Researchers need to understand and respect regional, national, and international boundaries and contexts including lifestyles and habits, mores, laws, and political and religious beliefs to prevent disease, promote health and the quality of life of persons and communities, and address unjustified health inequities (e.g., de Cosío, Díaz-Apodaca, Ruiz-Holguín, Lara, & Castillo-Salgado, 2010). As people migrate from rural to urban areas, developing to developed regions, and from continent to continent, the advance of industrialized activities contributes to environmental and climate changes, new (e.g., Zika, chikungunya) and reemerging (e.g., Ebola, measles) infectious diseases, injuries, and chronic noncommunicable diseases (NCDs). The latter, especially, resulting from unhealthy lifestyle behaviors, combine to create a double burden of disease (Baldwin & Korniewicz, 2012). In addition, natural and human-made disasters (e.g., earthquakes, bioterrorism) can further complicate the ability to engage in research for human health.

Although the focus of this textbook addresses intervention research in nursing practice, resources, references, and information for this chapter are from diverse interprofessional orientations. It is incumbent on nurses, the largest healthcare delivery workforce worldwide, to develop collaborations with other professionals, policy makers, nongovernmental organizations (NGOs), as well as community dwellers to expand their understanding of these interrelated complex factors. This will allow nurses to assess, design, implement, and evaluate culturally and regionally responsive interventions that simultaneously address health equity and inform health policy locally to globally.

To delineate a comprehensive approach toward addressing research typologies, including interventions in global settings, this section uses the six objectives outlined by the Pan American Health Organization/World Health Organization (PAHO/WHO) Policy on Research for Health (PAHO/WHO, 2009) as heuristic devices for reviewing, understanding, and generating investigations, including intervention research for health no matter which global region is the focus of study. The six interdependent objectives on the Policy on Research for Health are intertwined and work in tandem with the five goals of the WHO Strategy on Research for Health: organizational, priorities, capacity, standards, and translation (PAHO/WHO, 2009; WHO, 2010).
Objective 1: Generate Relevant, Ethical, Quality Research

Objective 1 focuses on developing tools to examine standards, indicators, impact, and cross-cutting issues, and identifying/resolving knowledge gaps in key areas (PAHO/WHO, 2009). As examples, Klingler, Silva, Schuermann, Reis, Saxena, and Strech (2017) posited that public health surveillance is not ethically neutral, yet training on the basis of comprehensive and clearly derived overviews of ethical issues for such programs is sparse. In their first-ever systematic review of ethical issues related to the topic of public health surveillance, Klingler et al. (2017) provide an ethics matrix for use in intervention and other research milieus to update guidelines, reports, policy, and strategy papers. These authors also incorporate educational tools and teaching/learning approaches for practitioners and the public.

In like manner, in their analysis of 36 multiproject research programs in 11 countries and two multicountries, Hanney, Greenhalgh, Blatch-Jones, Glover, and Raftery (2017) assessed the nature, research field, funding mode, time frame, and methods to assess impact of interventions and other research objectives, as well as the level of impact. Their analyses indicated widespread impact for some multi- and needs-led collaborative programs that could garner additional funding; however, improved standardized assessment methods could identify ways to improve research investment decisions (Hanney et al., 2017). Similarly, health systems guidance (HSG) are well-organized statements that support the development, evaluation, and reporting of evidence relevant to complex health systems; however, on the basis of a critical interpretive synthesis of the literature, no extant appraisal tools for HSG were identified (Ako-Arrey, Brouwers, Lavis, Giacomini, & AGREE-HS Team, 2016). On the basis of their review, these authors identified 30 concepts clustered into three domains (process principles, content, and context principles) that could serve as salient quality criteria in response to the evaluation of HSG (Ako-Arrey et al., 2016).

Health inequality and health inequity are important foci in research for health. “Health inequality” is a difference in health outcomes among individuals in a population, or between distinct groups, whereas “health inequity” is inequality that is unfair and avoidable (Whitehead, 1992). Systematic reviews are a salient approach to examine impelling and constraining forces for conceptual analysis that can foster ethical, quality intervention research and inform policy. The intent of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) checklist is to improve transparency of reporting systematic reviews (Welch et al., 2015b). Extending their PRISMA statement to include equity, these authors provide guidelines to enhance clear and complete reporting of health equity–centered systematic reviews. They argue that the enhanced reporting using equity-focused reviews can inform better policy and possibly reduce health inequity. Other significant developments are the growing number of agendas on research for health being developed by countries and to address regional and subregional health issues; nurses have influenced in different degrees the development of such agendas (Becerra-Posada, de Snyder, Cuervo, & Montorzi, 2014; Caribbean Health Research Council, 2011; Garcia, Cassiani, & Reveiz, 2015; Hotez, Bottazzi, Franco-Paredes, Ault, & Periago, 2008; PAHO/WHO, 2016).

Taken together, with training in evidence-based practice (EBP) and grounded in the exemplars for Objective 1, nurses with a passion for global health can perform systematic reviews on regional to global levels that can inform and promulgate research tools and that address relevant, quality intervention research, and influence research agendas. Garnering added training in policy development (DeMarco & Tufts, 2014) and developing collaborations...
with like-minded interprofessionals, nurses can make substantive contributions to ethical, high-quality interventions with a focus on low- and middle-income countries (LMICs) that also concentrate on health equity.

**Objective 2: Strengthen Research Governance and Define Research Agendas**

Objective 2 addresses the ability to build, support, and maintain health research systems by means of guiding research on the basis of past experiences, developing action plans, fostering and understanding the value of research from community to political levels, advocating for research resources, and stimulating regional to national ownership (PAHO/WHO, 2009). For instance, Bennett et al. (2017) identified 2015 as a banner year for global health with the anniversaries of the Global Alliance for Vaccines and Immunization; Global Fund to Fight AIDS, TB, and Malaria; adoption of the International Health Regulations; and formal entry into the Framework Convention on the Tobacco Control. These successes highlight the growth of global health diplomacy; however, they also noted chronic concerns regarding compliance, ongoing funding, and global health governance equity. The authors posited four themes consistent with Objective 2, including prioritizing within governance, identifying stakeholders, recognizing the relationship between behavior and health, factors critical to interventions, and the role of regulation and governance relevant to support at the global health level (Bennett et al., 2017).

In 2009, PAHO/WHO member states agreed to implement a Policy on Research for Health, the first of its kind, and was harmonized in its development with the subsequent WHO Strategy on Research for Health approved by the World Health Assembly in 2010 (WHO, 2010). Both the WHO and the PAHO are to monitor how countries and the organizations implement these policies and support countries in the process to ensure substantive progress is made with the six objectives so that all countries in the region have capacities in place to use research for health, and, when necessary, to develop research to address their public health needs. Pertinent to LMICs and health equity, despite reported advances in the health and life expectancy in Latin America and the Caribbean, inequality persists in this region (Villanueva, Abreu, Cuervo, Becerra-Posada, Reveiz, & Ijsselmuiden, 2012). These inequalities are frequently mirrored in the capacities of the countries to use research to inform their health policies and decisions, and to produce research that addresses their public health needs. In response to this need, members of the PAHO and the Council on Health Research for Development (COHRED) combined to develop an innovative web-based tool, HRWeb Americas (www.healthresearchweb.org), to accelerate the promotion of a national health research system (NHRS) in this region that advances research and provides indicators to monitor and evaluate progress. Topics include governance and policies, research priorities, including culturally relevant interventions, ethics reviews, regulation, partners and funding, resources, and announcements by region and country (Villanueva et al., 2012). In addition, a series of regional debates pulled together the sectors of health and science and technology under the auspices of the Latin American Conferences on Research and Innovation for Health (LACRIH) to find ways of strengthening the NHRSs so that they effectively strengthen a national research health system in LMICs (www.paho.org/LACRIH). These conferences were the foundation for initial inputs to feed the health research website.

Another important aspect of Objective 2 is the improvement of research-reporting standards with the definition of standards and checklists for all kinds of research for health, whether basic, clinical, public health, or health systems research. This is reflected in the series of organized guidelines that are accessible through the Enhancing the QUALity and Transparency Of health Research (EQUATOR) Network (www.equator-network.org) clearinghouse and the standards for leading publishers. An example is the guideline for the reporting of randomized controlled trials (RCTs) entitled Consolidated Standards of Reporting Trials (CONSORT), which also extended their guidelines to include equity-directed decision making (Welch et al., 2015a). A six-phase framework was used to create RCT guidelines, including
Considerations in Conducting Interventions in Specialized Settings

Chapter 18

Chapter 18  Considerations in Conducting Interventions in Specialized Settings  285

equity-relevant trials, empirical evidence, methods and experts, feedback and prioritization, consensus on guidelines, and distribution and implementation of the equity-focused CONSORT extension. The authors indicate that operationalizing equity in RCTs can enhance practice, policy, research, and concomitant interventions in the social determinants of health, clinical care, public health and health systems, and global health milieus (Welch et al., 2015a).

Recently, Rodríguez-Feria and Cuervo (2017) reported that regulated and nonregulated clinical trial registration in Latin America and the Caribbean has made significant, but inconsistent progress. The authors recommend that legislation require all research be available on international platforms (e.g., WHO International Clinical Trials Registry Platform [ICTRP]) before funding, show proof of registration, facilitate good research governance, and enhance the use of the ICTRP. Notably, during the revision of this chapter, a global announcement was made indicating that major research funders and international NGOs agreed on new standards that require all their funded or supported clinical trials be registered; summary results of clinical trials are to be made available for free through open access registries within 12 months of study completion (WHO, 2017). Trial registration is a strategic component of research for health, including clarity and dissemination of findings, forming and informing research initiatives and interventions, and advising policy. The ICTRP provides definitions of and guidelines for clinical trials and their registration, as well as other resources, including internships (www.who.int/ictrp/en). Research registration is also extending to other research methods, including the International Prospective Register of Systematic Reviews funded by the National Institute for Health Research in the PROSPERO database (www.crd.york.ac.uk/PROSPERO), as well as observational studies increasingly being registered in the WHO ICTRP. (Guidance for trial registration can be seen at https://youtu.be/CeJm5deW50E?list=PL6hS8Moik7ku2Luc8YDsZfDzNkEv08Kow)

Objective 3: Improve Competencies of and Support for Human Resources in Research for Health

Objective 3 emphasizes work with interprofessional partners, legal sectors, and research institutions to improve competencies, capacity building, and engaging others who influence healthcare, systems, and governance. In addition, this objective encourages the development and retention of research groups, promotion of gender and underrepresented ethnic group equity, and strengthening of staff to use scientific knowledge and systematic reviews to promote research evidence that lead to plans of action for human resources for health (PAHO/WHO, 2009).

In 2009, the National Institutes of Health–National Heart, Lung, and Blood Institute (NIH–NHLBI) and the UnitedHealth Group teamed up to support a collaborative network of centers of excellence (COEs) in Argentina, Bangladesh, China, Guatemala, India (Bengaluru and New Delhi), Kenya, Peru, South Africa, Tanzania, Tunisia, and both sides of the United States–Mexico border. The goal was the generation of evidence to inform policy and to reduce and prevent the epidemic of NCDs (see Nabel, Stevens, & Smith, 2009, for a complete overview). Each center included a research institution in its developing region that was paired with one or more academic partners in a high-income country. Projects incorporated effective strategies used in other multicenter, international research programs (e.g., Aitken et al., 2008), including health surveillance, research dissemination, development of culturally appropriate policies, practices and intervention tactics, and community participatory activities to support local and national leadership.

Contributing to the global burden of NCDs is the observation that, as a country’s economy develops, there is a concomitant increase in risky behavior, including smoking, change in diet, and increasingly sedentary lifestyles. Impediments to controlling this growth continue to include inadequate intervention research funding, failure to provide current evidence on disease burden to policy makers, health inequality, and academic programs that have yet to address chronic disease liabilities (Yach, Hawkes, Gould, & Hofman, 2004). On the basis of a set of targets issued by the WHO (2015), including a reduction in deaths from NCDs, GRAND
South (a network of 11 centers dedicated to research, capacity building, and advising on policy) developed a scorecard for tracking actions to reduce NCD burden (Roman, Perez, & Smith, 2015). Global experts developed a means to monitor progress from 23 high- to low-income countries on a 4-point scale (no to highly adequate activity) to assess four indicators (governance, risk factors, surveillance and research, and health system response). Findings show that NCD progress indicators vary and are relevant to country income and research structure. Future surveillance and outcome data will inform policy.

Most NCD-associated research addresses the behavioral factors of diet, physical activity, or smoking (e.g., Hughes, Hancock, & Cooper, 2012). Although these are essential factors relevant to health, frequently overlooked are the behavioral factors that contribute to poor sleep. Sleep disorders have been associated with several chronic NCDs, including cardiovascular disease, diabetes, mood disorders, overweight, and obesity (Stranges, Tigbe, Gómez-Olivé, Thorogood, & Kandala, 2012). Coauthor Carol Baldwin collaborated with the World Diabetes Foundation (WDF), PAHO, and academic programs, ministries of health, and NGOs along both sides of the United States–Mexico border. The outcome was a revised version of the NIH–NHLBI *Camino a la Salud: Su Corazon/Su Vida Manual para Promotoras y Promotores* (PAHO/WHO, 2014), which included the first session on sleep disorders and sleep health promotion in a manual of this type (Baldwin, 2014). Developed for lay health educators and promoters, the manual provides sleep health promotion and intervention information, as well as guidelines on diet, physical activity, diabetes, cardiovascular disease, and mental health to enhance health equity among underserved Spanish-speaking populations. The intent of the manual is to enhance training, competencies, and support for all persons engaged in human research for health. The Mexican Ministry of Health has since adopted training and interventions from *Camino al la Salud* for use throughout Mexico, primarily in rural areas to reduce the rates of diabetes. In addition, the bilingual sleep training is a component of the WDF-funded Certified Diabetes Educator program at the University of Guanajuato, Mexico; English versions train nurses regarding sleep and NCDs at academic institutions in the United States, and sleep health promotion and intervention strategies to community-dwelling adults. Many other examples emerge from collaborations in the Americas, such as the development of innovative approaches through collaborations to address chronic diseases in different environments of LMICs (Vedanthan et al., 2017) and to understand better context and variations (Bernabe-Ortiz et al., 2017; Miranda, Bernabe-Ortiz, Smeeth, Gilman, Checkley & CRONICAS Cohort Study Group, 2012).

Given the evidence of improved health of populations in LMICs, of growing importance are large-scale community health worker (CHW) programs. On the basis of their size and operational tasks, Perry et al. (2017) suggest that these programs require unique attention by policy makers, program implementers, and the global health community. For these reasons, Perry et al. (2017) cited a new online resource: Developing and strengthening CHW programs at scale: A reference guide and case studies for program managers and policy makers (see http://www.mchips.net/CHWReferenceGuide). This and other online resources cited in this chapter can lead nurses and their interprofessional colleagues involved in global health toward an improved understanding of the complexities of support and intervention training for human resources in research for health.

**Objective 4: Enhance the Impact of Research via Useful and Strategic Alliances, Collaborations, and Encourage Public Trust and Engagement in Research**

Objective 4 highlights interactions among multiple partners, opinion leaders, strategic alliances, WHO Collaborating Centres, and others for the purposes of innovation, sharing of ideas, and collaboration among various sectors (e.g., education, science, technology, non/for profits). The intent of this teamwork is to promote sustainable progress that addresses social determinants of health and facilitates equitable investment of resources to improve the health and well-being of populations (PAHO/WHO, 2009).
The work of coauthor Christine Hancock explicates Objective 4. She is the founder-director of the nonprofit NGO C3 Collaborating for Health and works with international programs and organizations that are interested in preventing NCDs. C3 Collaborating for Health tackles the major risk factors of poor diet (including the harmful use of alcohol), physical inactivity, and smoking that contribute to cardiovascular disease, diabetes, respiratory disease, and some cancers. In 2010, a coalition consisting of C3, the International Council of Nurses (ICN), Pfizer External Medical Affairs, and the International Alliance of Patients’ Organizations advocated for necessary social, economic, and political change regarding the global challenges of the lifestyle-related NCD epidemic. These organizations brought together a multinational group of stakeholders contributing different perspectives and expertise to explore a range of nurse-led options, ways to disseminate and implement evidence-based prevention interventions, and support personal health and well-being (C3 website; ICN, 2010). Hancock and colleagues also provide insight into the role the private sector can play, and describe a “business case” on NCDs for employees, consumers, and communities (Hancock, Kingo, & Raynaud, 2011). They provide a pragmatic and comprehensive review of ways in which business can work in partnership to make a difference for the better toward reducing NCDs and promoting health, thereby becoming part of the solution.

Another initiative coordinated by C3 Collaborating for Health, the “first 1,000 days,” designed a blueprint for change that enables women to have a healthy pregnancy and for their children to have a healthy start in life. This includes access to appropriate nutrition, including micronutrients, as well as screening for and management of conditions such as gestational diabetes. In joining this effort, the partners acknowledge the need for positively influencing women’s standing in society, including the cultural, family-related, political, and societal contexts set for maternal and child health. The development of interventions to promote health literacy among mothers and persons influencing their health will be an indicator for the long-term impact of these efforts and will be a key outcome of the partnership. The founding partners aim to build a wide consortium of like-minded partners and, using the existing evidence base, identify effective areas for intervention, and subsequently design and establish a large-scale pilot project in LMICs.

In addition to the developmental origins of health and disease, exposures to environmental toxicants, including heavy metal and endocrine-disrupting chemicals, are correlates of early life predisposition to disease risk in adulthood (Balbus et al., 2013). These authors underscore the need to comprehend in utero and early childhood experiences that may be risk factors for the development of NCDs separate from lifestyle choices made in adulthood. Social determinants of health, including poverty, gender inequality, education, and food insecurity, are factors of disadvantage in LMICs and should be incorporated into intervention research and have policy implications given that lifestyle choice necessarily reduces governmental and societal culpability (Balbus et al., 2013). These factors are essential to fostering strategic alliances and garnering public trust to address these issues, and open opportunities to develop sustainable capacities and human capital in research for health (Miranda et al., 2016). As well, to promote the understanding of research for health, and more specifically of the methods most frequently used in health technology assessment, Evans, Thornton, and Chalmers (2010) published a book geared toward the educated public that was later followed by a dedicated interactive website that includes the book now available in 14 languages (see http://www.testingtreatments.org).

A further example of practical research into interventions is the Community Interventions for Health (CIH) initiative, a program of the Oxford Health Alliance. This study focused on chronic disease prevention activities in select communities in developing country settings (India, China, and Mexico). It is comprehensive in its scope and design, including a combination of structural interventions, health education, and community coalition building as well as rigorous evaluation (O’Connor Duffany et al., 2011). An extensive analysis of each of the community’s environmental assets and challenges is incorporated by including stakeholder analyses, policy analyses, and an environmental scan that assesses physical attributes (Wong, Stevens,
O’Connor-Duffany, Siegel, & Gao, 2011). The interventions take place simultaneously in schools, workplaces, healthcare settings, and the community at large, with the goal of addressing physical inactivity, tobacco use, and unhealthy diets. Although all sites are engaged in the same broad categories of interventions, they are culturally specific and tailored to each setting. For example, in Indian schools, baseline data revealed the importance of addressing cultural norms around girls and physical activity, so one intervention strategy was to provide bicycle training for girls. In Mexico, the major focus of interventions is physical activity in the community, primarily music and dance. The results of CIH will provide guidance and a road map as to what works—or does not work—in these different settings, and pave the way for future intervention research.

Tackling tobacco use is also a public health priority—as reflected in the Framework Convention on Tobacco Control, the first international treaty on a health issue. Globally, more than 1 billion people smoke and 80% of these smokers reside in developing countries (Jha, 2009). Deaths from smoking-related diseases are already at 5 million a year globally and this is projected to reach more than 8 million by 2020 (Shafey, Eriksen, Ross, & Mackay, 2009). The Tobacco Free Nurses Initiative, funded by the Robert Wood Johnson Foundation, aims to ensure that the nursing profession is also prepared to promote health actively by reducing nurses’ barriers to involvement in tobacco control. It will equip them to assist with smoking cessation, prevent tobacco use, and promote strategies to decrease exposure to secondhand smoke. The Tobacco Free Nurses Initiative accomplishes its mission through (a) supporting and assisting smoking cessation efforts of nurses and nursing students, (b) providing tobacco control resources for use in patient care, and (c) enhancing the culture of nurses as leaders and advocates of a smoke-free society.

Objective 5: Foster Best Practices and Augment Standards in Research

Objective 5 concentrates on advocating for civil society to participate in research as a valued partner, provides access to and use of registries, systematic reviews, summaries, and briefs, works with local to international organizations to promote ethical review committees, and promotes indicators to assess effects of research, as well as standards and norms in line with research for health (PAHO/WHO, 2009). There are several advances in research that are of increasing interest to health policy and healthcare costs, including the use of comparative effectiveness research (CER) to inform the interaction of research and policy in developing countries, cost-effectiveness analysis of interventions to prevent NCDs, and operations research (OR).

The goal of CER is to improve health outcomes by developing and disseminating evidence-based information to patients, clinicians, and other decision makers, focusing on effective interventions for patients at individual and population levels (Chalkidou et al., 2009). Characteristics of CER include directly informing clinical or health policy decisions; comparing at least two alternatives, each with the potential to be best practice; results generated at population and subgroup levels; outcome measures that are important to patients; methods and data sources that are appropriate for the decision of interest (quantitative and/or qualitative); and studies conducted in real-world settings. Interventions may include medications, procedures, medical and assistive devices and technologies, diagnostic testing, behavioral change, and delivery system strategies.

As an example of CER to policy, Rubinstein et al. (2010) estimated cost-effectiveness ratios from six interventions, including salt reduction in bread, a media campaign to promote tobacco cessation, pharmacological treatment of hypertension, elevated cholesterol and tobacco cessation, and multidrug approach for Argentinians with an absolute risk estimate greater than 20% in 10 years. Results outlined in detail the cost savings in disability-adjusted life years, incremental cost-effectiveness ratios, and dollar amounts for pharmacological treatment. Findings from this research inform policy makers on resource allocation to reduce the cardiovascular disease burden in Argentina. The application of CER can help to determine the salience, cost burden, and other factors relevant to interventions.
OR uses advanced analytical methods to understand complex systems and making complex decisions. Methodology includes simulation not unlike the simulation labs used in nursing and medical schools, and Decision Theater, which brings together interprofessionals to manipulate various standards, norms, and factors involved in research for health. Bradley et al. (2017) performed a systematic search of the literature using OR in global health relevant to the theme of health equity. The three essential components identified for success in bridging OR and global health policy, interventions, and other research included collaboration with stakeholders, contextually appropriate data, and communication outlets for research findings. Having community members, thought leaders, and other stakeholders collaborate to determine the variables for study and altering such variables, OR holds enormous potential to determine the most feasible and cost-effective research for health approach for any given region. The use of research-reporting standards, like standards in other aspects of research, are essential to increase the value of research and reduce its waste (REWARD-EQUATOR Conference, 2015; The Lancet, 2014).

Objective 6: Disseminate and Utilize Research Findings

Objective 6 emphasizes the need to make visible regional to national research and disseminate the use of knowledge to improve health, equity, and development; work in cooperation with specialized centers and media to improve understanding of the value of research for health; participate in international intellectual property debates; and promote health via knowledge translation initiatives and tools (PAHO/WHO, 2009).

In addition to publishing original research, systematic reviews, opinion pieces, white papers, and policy briefs in professional journals, and as posters and papers at notable international conferences, various approaches are available to disseminate and apply research. The PAHO Evidence Informed Policy Network (EVIPNet), on the basis of the EBP synthesis and analysis methodology, facilitates knowledge transfer and translation of research into programs, policies, and law (Chapman, 2012; WHO, 2016). Cochrane is a predominantly online independent network of more than 30,000 mostly volunteer researchers, biostatisticians, professionals, patients/consumers, scientific communicators, and others providing informed decision making to promote global health (www.cochrane.org). The organization is based on and draws from the work of Archie Cochrane, who emphasized using research evidence to provide information that was more reliable than other forms of information; it emphasized the need of research fit for purpose (Cochrane, 1972).

The Patient-Centered Outcomes Research Institute (PCORI), established in the United States and authorized by Congress, is a private, independent, nonprofit institute that represents the needs and perspectives of the healthcare community, as well as acting as reliable information resource (Barksdale, Newhouse, & Miller, 2014). The PCORI funds CER that evaluates the risks and benefits of interventions, procedures, medical devices, and diagnostic tools; healthcare promotion; management and delivery programs; and other evidence-based strategies used to promote health and prevent, treat, and manage disease (Barksdale et al., 2014). Although the intent of CER is to promote cost-effective practice-based interventions that can inform the PCORI, a focus of CER is to implement interventions to improve health outcomes and reduce inequality in large, local, and global patient populations. Implementing CER requires the development, expansion, and use of a variety of data sources and methods to assess comparative effectiveness and disseminate the results.
One final topic area that crisscrosses all six of the PAHO/WHO objectives and is highly relevant to research and interventions in global settings is a brief commentary on “big data.” The concept of big data can be defined as the collecting and storage of a large volume of information at an unprecedented speed in a wide variety of formats including structured traditional databases, as well as unstructured text files, audio/video information, and several types of transactions, the magnitude of which may pose management difficulties and the quality of which may vary, affecting accurate analysis (Tattersall & Grant, 2016). Software developers, including IBM, Microsoft, Hewlett Packard, and others, globally have developed a variety of solutions for use by governments, international development, manufacturing, modeling, education, media, online technology (e.g., Amazon, Google, eBay), science, healthcare, information technology for retail and real estate purposes, sports, and research activities (World Economic Forum, 2012).

For the purposes of this textbook section, the focus is on the pros and cons of big data in global research, including interventions. Big data studies have ranged from surveillance studies for the occurrence of the Zika vector on the basis of elevation as a proxy for transmission of the virus (Watts et al., 2017) to global maps of insecticide resistance risk for vector control (Coleman et al., 2017) to clinical trials applied to precision medicine (Weng & Kahn, 2016) to the use of big data for improving health in LMICs (Wyber et al., 2015). These topics alone suggest substantive and diverse applications of big data to global health issues.

There are, however, as many disadvantages as advantages to the global use of big data. For example, there are serious concerns regarding the confidentiality and security of personal health information in LMICs (as well as developed countries) that are intended to collect the use, cost, outcomes, and impact of health services at subnational and national levels (Beck, Gill, & De Lay, 2016; Salerno, Knoppers, Lee, Hlaing, & Goodman, 2017). Recently, a Framework for Responsible Sharing of Genomic and Health-Related Data, and outcome of the Global Alliance for Genomics and Health (GA4GH) have been posited as a more positive approach to address human rights from the privacy, nondiscrimination, fair access, and procedural impartiality to address the challenges of big data and the respect for human dignity (Salerno et al., 2017). Other issues that hamper the use of big data in global research are inherent in its definition, that is, different database structures, including coding of diagnoses, medications, laboratory results in structured data and clinical narratives in unstructured data, different terminology systems, timing of data collection, coding differences, as well as variations in analytical procedures that can converge to result in suboptimal levels of patient care, and hinder the development of evidence-based interventions. One approach to tackling these issues at the global level is that of a systematic emphasis on deriving models from smaller datasets to visualize ways in which the public, politicians, and policy makers can understand the value of big data as applied to big global health research (Mann et al., 2016).

Finally, in terms of clearinghouses and collections focused on addressing the public health questions, and the questions faced by policy makers, McMaster University has developed and maintained free access comprehensive databases that pull together, index, and curate systematic reviews, policy briefs, and policy documents from intergovernmental organizations. These databases offer free access (with registration) and can be found at www.healthevidence.org and www.healthsystemsevidence.org respectively. When it comes to emergency response, EVIDENCEAid, a spin-off of the Cochrane Collaboration, is an important resource of research evidence (www.evidenceaid.org). The development of these resources, as well as the subsequent distribution of indexed WHO (http://apps.who.int/iris) and PAHO documents (http://iris.paho.org), has changed the landscape enabling the public to identify better policies and priorities, and the relevant research evidence and policy options.
Chapter 18  Considerations in Conducting Interventions in Specialized Settings

Key Points From Section 18.1 of This Chapter

- Designing and implementing culturally and regionally responsive interventions require an understanding and respect for boundaries, mores, laws, political and religious beliefs, as well as lifestyles and habits.
- Evidence-informed (or based) healthcare requires the integration of values and context with research; missing the considerations of values and context in which research is applied can result in unhelpful or harmful application of research findings (Evans et al., 2010; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996).
- The six interrelated PAHO/WHO objectives on the Policy on Research for Health are salient heuristics for understanding research intervention needs in global settings.
- Although many global interventions address new and reemerging infections, the need for transdisciplinary studies aimed at reducing and preventing NCDs associated with lifestyle will continue to increase.
- Cost-effectiveness research, eHealth, evaluating large datasets (big data), global clinical trials registration, information technology, OR, and knowledge transfer are important growing trends and technology relevant to interventions in global settings.