



# Introduction

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From the agrarian era through to the industrial era and now the electronic/information era, the subject of human health and disease diagnosis has remained a significant part of the central concerns of man in his determination for worthwhile survival on Earth. What has changed over these periods, however, are the definition of human health; the kind and extent to which technology is applied to problem-solving; the speed/ease of acquiring, transmitting, and utilizing data for the prediction of health status or disease diagnosis; and the application of multidisciplinary approaches to health care such as the simultaneous use of knowledge from agriculture, medicine, nutrition, economics, etc., to mention a few. In ancient times, health was seen from a religious perspective as one in which good health comes from God or some deity (Badash et al., 2017). Later definitions saw the inclusion of social perspectives such as temperance and personality (Badash et al., 2017), then, to the more all-inclusive definition of good health by the World Health Organization (WHO), as “a state of complete physical, mental and social well-being, not merely the absence of disease” (WHO, 1946). Another currently accepted view on health is that suggested by Dubos (1959). His definition of health, as “the condition best suited for each per-

son to reach his or her current personal and social goals,” recognizes that a person’s health status can change over time and space/environment. This makes early identification/diagnosis of a shift from complete wellness to any level of unwellness along the continuum from wellness to unwellness a key to sustaining man at the height of his potential. Modernity in health and disease diagnosis, therefore, has given man the impetus to aspire to attain a “health for all” status (i.e., physical, mental, and social wellness for all to attain their maximum potential at any one time).

The actualization of health for all across the globe is driven by the United Nations under its Sustainable Development Goals (SDGs) program and the African Union under its Aspiration 1 of Agenda 2063 program and implemented by all governments and actors signed on each of the programs. The 17 SDGs were set up in 2015 to serve as a “blueprint to achieve a better and more sustainable future for all” by the year 2030.

In Nigeria, the women in STEM in the University of Port Harcourt, under the aegis of Organization for Women in Science for the Developing World (OWSD), University of Port Harcourt Chapter, are contributing to the global pursuit of sustainable health for all through the delivery of monthly seminars around the theme “Modernity in health and disease diagnosis: The account of women in STEM” and the publication of the papers for dissemination to a range of audience across the globe. The title Modernity in

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Health and Disease Diagnosis: The Account from STEM women is a compilation of chapters that bring to the fore interesting insights on the current state of knowledge and best practices in the topics addressed. The topics can be broadly grouped into two: those that cover the application of current computer technology in early disease diagnosis, treatment and research (Chaps. 2, 5 and 7) and those that present the current knowledge on human health from the perspective of agriculture, nutrition, economics, chemistry and communication (Chaps. 3, 4, 6, 8–14). They largely provide information that border on SDG 3- “to ensure healthy lives and promote well-being for all at all ages,” yet some address other SDGs such as SDG 2- “End hunger, achieve food security and improved nutrition and promote sustainable agriculture,” SDG 5- “Achieve gender equality and empower all women and girls,” and SDG 9- “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.” Chapter 2 is an interesting article on Cloud Computing.” Here, readers will be enraptured by the concept of cloud computing and its promising potential as they learn of the variety of opportunities for manipulation, configuration, and access to data through cloud computing-enabled resources. They will also be enlightened on basic cloud computing service models and the best ways to utilize them in various service delivery sectors as well as in academic research. Researchers and practitioners working on all SDG targets and indicator workspaces will benefit from this chapter by way of enhanced knowledge and work efficiency but more specifically to workers in the 9.4, 9.5, 9a, and 9b target workspaces. In Chap. 3 , “Significance of Nutritional Etiquette to Women’s Health,” the author discusses the importance of nutritional health which is directly related to how the body utilizes food nutrients for development and optimal performance, and how responsible eating choices amount to normal body dimensions (anthropometry). Readers will learn the benefits of engaging in nutritional etiquette for sound health. They will also appreciate the need to consciously build an optimum nutritional status to guard against malnutrition. The chapter

further furnishes readers with nutritional behaviors that are significant to women’s health and their consequent effect on fertility/reproductive health and outcomes on offspring. The chapter addresses SDG 2 and will be useful to workers in its various target and indicator workspaces. Chapter 4 provides current information on the brain disease called Alzheimer’s, a progressive and degenerative brain disease that results from the stiffening of healthy brain cells to death, which in turn leads to increasing loss of memory. Readers will find detailed information on how and why this happens, and why women are at greater risk of Alzheimer’s. This chapter would spur women in STEM to read and practice the lifestyle changes discussed in the text as they become apprised of the factors that predispose especially women to this chronic disease. Statistical evidence on women and Alzheimer’s contained in the chapter will prove a startling need for intentional individual and collective effort toward exploring avenues for prevention or deceleration of the progression of the disease, thus, enabling women (and men) to remain helpful to society. This chapter will be useful to researchers and practitioners working on SDG 3.4.1 (C030401) target and indicator workspace as well as those in target 5.b “Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.” In Chap. 5, readers will learn about artificial intelligence (AI), its latest application in the early detection of heart diseases, and how such early detection saves lives and ensures a better quality of life. Readers will learn about the powerful neural network (NN)/deep learning AI model that is inspired by how the biological neuron works and how it is used for the early detection of heart failure. They will also learn about machine learning, an AI model that is made up of algorithms that can improve themselves over time using big data, and how this makes them highly suitable for solving new problems in an ever-changing world. The chapter also explains how the application of a new AI machine learning algorithm has made it possible to detect, early enough, two life-threatening heart conditions (hypertrophic cardiomyopathy and cardiac

amyloidosis) that would otherwise be impossible to detect without AI. It will be evident how these, indeed, set the pace for a revolutionary diagnosis, treatment, risk prediction, and clinical care in cardiovascular medicine. This chapter will be useful to researchers and practitioners working on SDG 3.4.1 (C030401) target and indicator workspace. Chap. 6 discusses antimalarial drug resistance, and highlights women as the most vulnerable group. It is an engaging read as readers learn about various vulnerable groups to malaria, different malaria-causing plasmodium parasite species, their significant levels, etc. Therein, factors that impose vulnerability on women are discussed and backed with statistical evidence that span across a few continents. A major highlight in the chapter is the WHO's recommendation for the establishment of a malaria treatment that ensures the annihilation of the parasite and the factors that could antagonize the effort, resulting in treatment failure. The precursors of anti-malarial drug resistance are also addressed, and gender connections are made especially as it relates to women as they are advised on the steps to follow to deal with and combat this resistance. This chapter addresses SDG 3 and will be useful to researchers and practitioners working on SDG 3.3, and 3d target and indicator workspaces. Chap. 7, is an exposé on robotics and automation. It also explained the difference between robotics and automation and showed how these innovations have transformed on healthcare services. Readers will learn that automation has found applications in areas such as patients' and doctors' appointment scheduling, financial management, healthcare staff protection and safety, medical record-keeping, clinical diagnosis, surgical procedures, and decision-making by analyzing patient data and recommending treatments. Readers will also learn that robotics, on the other hand, have been applied in various healthcare settings. Some examples include the impact of medical robots in enhancing surgical procedures and precision tasks, and in minimizing invasiveness. Also, the roles of industrial and domestic robots are discussed, and worthy of note is the role of Unmanned Aerial Vehicles and boats in rescue

missions and surveillance. This chapter also highlights the role of robotics in patient care such as in the monitoring of patients and in the development of prostheses for amputees. Additionally, the role of robotics in diagnosing and treating diseases, particularly in situations where contact between doctors and patients needs to be minimized, such as during infectious disease outbreaks are discussed. Researchers and practitioners working on SDG 3.3, 3.4, 3.6, 3.8, 3b and 3d target and indicator workspaces will find this chapter useful for monitoring and evaluation. Chap. 8, discusses the significance of naturally-derived surfactants in healthy food formulations and their role in achieving improved nutrition, food preservation and food security in a rapidly growing global population. Readers will learn that formulated foods, which are foods prepared with ingredients that enhance the nutritional value and provide additional nutraceutical benefits, are not only composed of carbohydrates, proteins, fats, or lipids, etc., but also contain naturally-derived surfactants (NDSs) that function as stabilizer through processes like emulsification and dispersion. The utilization of NDSs in various food applications, such as confectionery, emulsions, fat spreads, and bakery, is highlighted. This chapter addresses SDG 2, particularly targets 2.3 and 2a. Chap. 9, "Re-thinking Agenda 2063: Leveraging STEM Women Empowerment for Food Security in a PostSDGs and target-Covid-19 Pandemic Era," enunciates the adverse effects and socioeconomic impacts of the COVID-19 pandemic with a special focus on its impact on women. Furthermore, the distinct place of women in curtailing the magnitude of hungry people, globally, through various agricultural enterprises that create a formidable post-COVID food system was articulated. The chapter proposes the engagement of STEM women in a strategic manner to achieve food security and alleviate the projected estimation of people who would go to bed hungry, especially following the COVID-19 pandemic, through two broad paths: (1) the direct empowerment of STEM women and (2) the transfer of knowledge to relevant beneficiaries. This chapter addresses SDG 5, particularly targets 5.5 and 5c, "to ensure women's full

and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life” and “adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels,” respectively. In Chap. 10, readers will come across a discussion on the threat to life imposed by the global plague of antimicrobial resistance, the need to urgently tackle its spread, and how to tackle its spread simultaneously at the human, animal, and environmental levels. Readers will note the dangers humans are exposed to on account of the high (87%) resistance of widely available *E. coli* and ESKAPE pathogens to drugs. This chapter addresses SDG 3 and will be useful to researchers and practitioners working on SDG 3.3.3, 3.d.1, and 3.d.2 target and indicator workspaces. In Chap. 11, curious librarians and interested others will acquire information on how to systematize library information to meet public health emergencies in this fast-changing, developing world. They would become abreast with the impending dangers that could plague “Information-Vulnerable Members of Society” as they become aware of the place of knowledge and authentic information, especially in public health emergencies. The challenge of information handling in the modern world and possible mitigative measures against those challenges as well as the place of appropriate professional skill set including, broadly, sourcing, verification, identification, and dissemination of information in information handling are found therein. This chapter addresses SDG 9 and will be useful to researchers and practitioners working on SDG 9.5, 9.a, 9.b, and 9.c target workspaces and their indicators. In Chap. 12, information on the diseases associated with imbalances in the human gut microbiome is presented. Readers will learn about the microbes that reside within the human gastrointestinal tract (GIT) – collectively referred to as gut microbiome (GM). Readers will appreciate the human gut microbiomes differently after reading this chapter. They will become conversant with the development of the gut microbiome; gut microbi-

ome roles and constituents; proportions of microbes resident in the human gut among others (as most of these microbes are beneficial while others are capable of causing diseases, malfunctioning, and altogether affecting physiological functions); their relationship with the development of diseases of the human body; and the recommended actions to keep the system balanced for healthy living, particularly for women. It is hoped that researchers and practitioners working on SDG 3.4.1 (C030401) target and indicator workspace will find this chapter useful in the planning, implementation, and monitoring of projects focused on enhancing the health status of women. In Chap. 13, the topic “Chemical Safety and Chemical Security; a Guide to Preventing Health Hazards” is discussed. The chapter posits that chemical safety and chemical security are two essential practices that minimize the adverse effects of chemicals on the environment. According to the article, Chemical safety refers to practices that protect humans and the environment from exposure to hazardous chemicals, while chemical security aims at preventing the deliberate misuse or theft of chemicals for criminal activities. Chemistry enthusiasts and professionals will enjoy this read particularly when in search for best practices to adopt while at work with chemicals and explosives or during the production of hand sanitizers as was the case during the COVID-19 pandemic era. This chapter addresses SDG 2, particularly targets 2.3 and 2c. Finally, Chap. 14, entitled “Chemical Leaching into Food and the Environment Poses Health Hazards,” exposes the dangers of the misuse of plastics to humans and the environment, particularly the danger of cooking with plastics on fetus, children, and even adults. Readers will learn about toxic metalloids and important chemicals that, if ingested, could result in severe endocrinal anomalies in humans. These toxic chemicals are also persistent in the environment and are purported to drive many challenges which are mostly long-term. Readers will also learn the role of “additives” in the production of plastics and their relationship to plastic pollution. The chapter will educate readers on the classes or types of plastics

and how knowledge of these class types can help consumers ward off various health and environmental challenges that could arise from the inappropriate use of these materials. It calls the attention of all to the need to use modern Plastic Codes to determine their ideal usage. This chapter addresses SDG 3 and will be useful to researchers and practitioners working on SDG 3.9.2, 3.9.3, 3.d.1, and 3.d.2 target and indicator workspaces.

## References

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