

The Importance of Clean Water

Abstract

Water makes up more than two-thirds of the human body; the human brain is made up of 95 percent water, blood is 82 percent water, and lungs are 90 percent water [1]. Water is vital component to every living organism in the world, especially the human species. More often than not clean water is not accessible to many human beings worldwide. This is quite alarming because of all the detrimental aspects that are associated with unclean water that is often used. Many individuals would rather consume and utilize unsanitary water than none at all. Take for example the alarming number of people that drink unsafe water worldwide, a staggering two billion people [2]. More statistics on prevalence, the importance of clean water, and how such an issue in relation to its public health implication will be discussed in further detail in this paper.

Keywords: Clean Water; Public Health; Importance of Clean Water; Sanitation; Safe

Introduction

H₂O or water however one would like to call it is such an important factor for life to continue. Water is so important that without it, a human being can on survive for a matter of a few days [3]. The human body is approximately 75 percent water and is essential from the continuation of life and homeostasis of the body [3]. Water is used in the human body for a number of different functions, such as a lubricant in the body, body temperature regulation, removing harmful toxins in the body, and transporting nutrients throughout the body [4]. Simply from all of the previously listed functions of water in the body, one can evaluate the absolute necessity of water. The importance of water is critical, however even more importantly is the concept of clean water. It is estimated that each person on earth is required 20 to 50 liters of clean safe water each and every day [5]. This clean water is to be used for drinking, cooking, simple hygiene, etc. [5]. There are a number of different infectious agents detrimental to human health that grow in contaminated/unsanitary water which can cause a number of waterborne illnesses; such as cholera, hepatitis, typhoid, and diarrhea [6]. Take for example, diarrheal diseases from cholera, this agent and illness is responsible for 1.8 million deaths worldwide [5].

These deaths can be preventable with the proper knowledge, education, and infrastructure put in place. The importance of clean water is more often than not neglected in the developing world. Many people understand the importance of water; however, these individuals tend to not completely understand the importance of

that water being clean. The United Nations has labeled the access to clean water a basic human right [5]. They continued by addressed this issue as being a critical step towards the improvement of living standards in the whole world [5]. Lacking proper sanitation does not only give the grounds for development of disease, but it overall robs a human being's basic human right. Water borne diseases are easily spread because the drinking water systems are not suitable for human use [7]. Many places worldwide receive their water sources from surface waters, such as rain, creeks, rivers, lakes, etc. [7]. The issue with this is that animals or even people can be using such water sources and contaminating them and making the water very unclean for further human use [7]. To add to the contamination from humans and animals, nature itself can contaminate the water and make it unusable, however many populations are forced to use these unsafe water sources [7]. Further discussion on this matter will be presented in this paper.

Literature Review

There are a number of different factors that contribute in the accessibility of clean water. These factors include physical, demographic, geopolitical and lastly economic/socioeconomic status [8]. Physically, some water supplies are difficult to access because treacherous topographical factors and/or unbearable climate circumstances [8]. This then would force individuals to access dirty water, out of desperation. Secondly, the demographics of a location can also effect the accessibility to clean water due to issues that of over population. For example, in cities that have large

populations, some people cannot obtain the appropriate amount of water due to the high demand the population is consuming [8]. Geopolitically speaking, due to water being obtain from river's water flow worldwide, people downstream of locations rely on people upstream to maintain the purity and cleanliness of the water. If a river runs through multiple countries, the likelihood of the water becoming contaminated is greater [8]. Lastly, and most importantly, economic/socioeconomic will have clear implications on accessibility to clean water. Socioeconomic status is very complex by means that is incorporates occupation, education, financial, and location influence [9]. All of these factors can influence how a population can access clean water.

For example, in Matlab, Bangladesh, in communities that have lower socioeconomic status actually have a higher prevalence of cholera outbreaks [9]. Chris Williams from the Water Supply and Sanitation Collaborative Council (WSSCC) said that "People who do not have access to a hygienic toilet and a place to wash their hands are exposed to an array of faecally transmissible and potentially deadly diseases that with improved sanitation are easily preventable...An environment that lacks sanitation and clean water is an environment where achieving other development goals is an impossible dream..." Clean water is an absolute necessity for sanitation and hygiene. These are motors which drive health, social, and economic development around the world [10]. Without clean water however, economic development is unseen. This then becomes a vicious cycle for the the economically disadvantaged groups worldwide. Similar to poverty, those that do not have the fiscal funds to provide access to clean water are obligated to stick to unsafe water, which in turn harms their health and puts them at a disadvantage to excel, in an economically speaking manner.

In Sub-Saharan Africa, approximately 40billion hours every year are lost in the effort of collecting water [11]. These hours are equal to France's entire annual workforce. To add to this astonishing fact, the amount of water needed to be carried is between 40 and 70 pounds of water which can be for extremely long distances [11]. One out of the nine individuals worldwide actually lack the access to clean water [11]. In essence without clean water, a population cannot grow food, building homes is halted, staying healthy is threatened, children cannot attend school, and overall employment in the region is at risk [11]. The community is most effected due not being able to access clean water in terms of health, hunger, and education [11]. The two main factors that hold communities back from their bright futures are illnesses from drinking unsafe water and the time required in fetching water due to access being an issue [11]. If clean water becomes more accessible for populations it can be safe to assume that health will also increase; this in turn will decrease the time lost to sickness. If you have less sick individuals then they are more likely to stay working which can increase economic development [11].

Hunger within the community can also be maintained and controlled by having access to clean water. Food security can be established which is caused because there is less crop loss due to caring for fields in the proper manner [11]. Lastly, education for students is commonly affected because children are often the

ones that gather water for families in Africa; this requires them to miss school. If clean water becomes more readily available, young students can stay in school receiving an education. There are tremendous benefits from a educated population as seen throughout developed countries worldwide; these benefits are obviously improved health, economic growth, and political stability [12]. Simply attending school and receiving an education, people in a society are better equipped to prevent diseases. In addition to preventing diseases they are more likely to effectively use the health services they have accessible to themselves [12]. Education and economic growth go hand in hand, in developing countries around the world with each addition year of education it is averaged that their wages tend to increase by 10 percent margin [12].

It has been determined that if a country cannot reach a literacy rate of 40 percent in their adults then that country is at a disadvantage when trying to achieve economic growth [12]. Lastly, educating the population will allow for people to understand their civil rights and recognize what they are entitled to as humans from their governments [12]. Many negative impacts of not having access to clean water have been discussed already, however the list can continue on and on. Take for example diarrhea, which is considered to be the most important public health problem with its relation to unclean water [12]. The numbers are remarkable, four billion cases of diarrhea a year, 1.8 million deaths; of these deaths, approximately 90 percent are said to under the age of five [12]. Another disease that is the leading killer worldwide and predominant in Africa is malaria [13]. Malaria is responsible for approximately 90 percent of the one million deaths worldwide occur in Africa [14]. Nine out of ten cases of malaria worldwide occur specifically in sub-Saharan Africa [14]. The implications of malaria are not just medically relate but economically; economic growth has been slowed due to malaria in Africa by 1.3 percent per year; this equates to a compounded rate of 32 percent of economic decline in the past 35 years [14].

Another negative impact of unclean water is how contaminated water serves a means for the transmission of fecal diseases. Take for example India, three out of five individuals will defecate in the open in rural villages which in turn contaminates the water [15]. This poor sanitation that seen throughout India is responsible for one out of ten deaths and causes India to lose approximately six percent gross domestic product annual [15]. This viscous cycle repeats itself over and over robbing the India as a country from developing to its full potential economically. Such incidents like this which creates unsanitary water sources has been linked to numerous outbreaks of fecal oral diseases, such as cholera and typhoid [7]. Not only is clean water needed to avoid infectious agents from deteriorating life but it is also an absolute necessity for the physiological functions of the body. As most of the body is composed of water, it can be deduced that water is quite important. Water is needed for the basic functions of the human body such as sweating, digestion, brain function, movement, filtration, and much more [16].

For example, an adequate amount of water is need for your body to clean itself by means of perspiration, defecation, and urination [16]. Without water liver and kidney function are impaired and excretion of waste cannot be completed, such as

urination. In terms of defecation, the body hardens or softens stools by water content [16]. Water also is needed for body temperature regulation; maintain a temperature so that contents within your body do not get overly cold or hot to the point that health is at risk. Hydration is critical for eyes, mouth, and nose; simple matters that many overlooks are strictly regulated by the presence of water [16]. Making sure the human body is hydrated maintains adequate levels of moisture for sensitive areas all throughout the body; such as in the brain, bones, and the blood [16]. These are just a quick overview of the different mechanisms that require water; giving the body unclean, dirty water can lead to drastic consequences. In 2000, the World Health Organization (WHO) conducted a study that determined that 2.2million deaths were attributed to contaminated water diarrheal diseases [17]. During the Johannesburg Summit in 2002, it was said that “More than five million people die each year from diseases caused by unsafe drinking water, lack of sanitation, and insufficient water for hygiene. In fact, over two million deaths occur each year from water-related diarrhea alone. At any given time, almost half of the people in developing countries suffer from water-related diseases [17]. Everyday it is estimated that one thousand lives of children are taken from illnesses like diarrhea, dysentery, and cholera because of unclean water and unhygienic living conditions [2]. Due to mortality being so high for there are other consequences that have been discussed, such as lost work days, missed education, health care costs, and the draining of family resources.

Discussion

Dr. Margaret Chan, the Director-General at the WHO, was quoted as saying, “The world needs a global health guardian, a custodian of values, a protector and defender of health, including the right to health.” [18] “The Right to Health,” there are four elements that are necessary: availability, accessibility, acceptability, and quality. [18] Water is available to everyone, however, is this water able to be used for means of living without affecting one’s health? Can one truly say that there is an equal opportunity to access clean water for everyone? There is an overwhelming amount of obstacles that citizens in throughout the world must overcome in order to obtain the necessary amount of clean water. Economic accessibility or physical accessibility are the two main sources that cause a vast dilemma for the majority of underprivileged individuals living in the world, whether rural or urban living [18]. The organization Action Against Hunger (AAH) has developed a program that provides water for those that are in need of clean water [2].

They truck water into affected areas and install storage tanks and reservoirs [2]. If water is unsafe for human use, AAH drills and decontaminate wells, install hand-pumps, protect natural springs, tap aquifers, rehabilitate damaged infrastructure, and pipe water to places that are hard reach without outside help [2]. In 2013 alone, this organization has provided clean water for 3.5 million people and is continuing to do so [2]. Another organization has a similar agenda that targets sub-Saharan, The Water Project [11] Their goal is to improve health, education, hunger and poverty by means of provided access to clean water [11]. They understand the time lost to gathering water and illnesses from unclean water and its

impact of everyday life. As discussed earlier, education is also lost to sickness. Economic development is lost while people merely try to survive. Their goal is to ultimately to end this needless suffering just to survive [11]. The United Nations developed a Millennium Goals agenda to ensure that people would get safe water [11]. Nations globally, water conferences, and aid organizations have publicized efforts to improve global access to water. In 2000 the World Water Forum guaranteed “that every person has access to enough safe water at an affordable cost to lead a healthy and productive life and that the vulnerable are protected from the risks of water-related hazard” [11].

Conclusion

Having access to clean water is often neglected and not understood completely. It is crucial that attention is brought to this topic because of how many innocent people are dying every year. Initial goal needs to be implemented by government officials and policy makers to look out for those individuals that lack access to clean water. Since it is harder for underprivileged parties to access water, planning and strategizing need to be incorporated into the system to ensure everyone has the access available. Resources should be rearranged, and reformulated strategies should be adopted to benefit the disadvantaged groups; this will allow for the improvement of access for the low-income populations and make a huge difference in standards of living for them [19]. Finally, education must be set as priority to create a new mindset for the people. Education on all levels, including health and non-health related, must be emphasized to the citizens of lesser developed countries. Investing into the population by fiscal means and informational will undoubtedly help the health of all individuals in the society. There is a relationship between education and health; education can open opportunities for better health as well as poor health can hinder the education process. This ties in closely with the roles of Public Health; to lead to prevention of disease, to prolonging life, and to promoting health. Prevention is better than the treatment [19,20]. The public health of people that do not have adequate clean water is at risk and needs attention from the government officials and leaders that run and operate the country. The country’s health can be fixed but hard work, policy reform, program implementation, education, and a shift to prevention are necessary.