

# **Medical Journalism: Delving into Nutrition in the novel *Red Madness: How a Medical Mystery Changed What We Eat* by Gail Jarrow**

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## **Abstract**

Medical Journalism is an interdisciplinary field that communicates healthcare information to audiences through various forms of media including print, electronic, and its integration in novels. This article highlights on *Red Madness: How a Medical Mystery Changed What We Eat* by Gail Jarrow, which chronicles the history of Pellagra and its connection with medical journalism. A nutritional disorder caused by deficiency of niacin, an amino acid that the body can convert into niacin. It is characterised by three D's. Various theoretical frameworks are explored to understand the disease. It also identifies the importance of effective communication in bridging the gap between scientific discoveries and public understanding which influences the health practice.

**Keywords:** Medical Journalism, Pellagra, 3D's, Niacin Deficiency and Red Madness

## **Introduction**

Medical Journalism is an interdisciplinary field, applying the knowledge of rhetoric and science to enhance understanding of medical phenomena to the readers. It refers to effective communication such as reporting news, analyzing, and communicating facts or information related to healthcare, and medical research. It involves disseminating accurate and understandable information and educating and raising awareness about medical advancements, policies, and various aspects of healthcare to the public and healthcare professionals. There are many different audiences in medical writing. Medical Journalism can come from various sources including news articles, stories, blogs, movies, journal health columns, interviews with experts, medcoms, podcasts, and medical content writers. Through these bases, medical content is given to the audience in the most effective ways possible.

Medical journalism influences an individual's quality of health care. At times, it is the comparative ease as information can be attained from the internet on new medications and treatments for their conditions. In extreme cases, people will compare their symptoms, real or imagined, to various sicknesses in an attempt to diagnose themselves. Sometimes, news articles convey misleading information about healthcare. Here, reporters or news fail to provide proof of clinical study and to supply reasonable context. The lack of knowledge in health creates a situation where a person can be easily swayed to a certain point of view that is cast in the manner in which information is reported. Subsequently, this casts a possibly undesirable spotlight on a disease.

**Journalism – Print**

Medical Journalism in print refers to reporting and disseminating news and information about health, medicine and healthcare through printed publications such as newspapers, magazines, journals and even newsletters. Print news media dedicates separate sections or columns that focus on health and medicine covering a wide range of topics including disease outbreaks, medical research, public health policies, reforms and lifestyle trends affecting health. Researchers reporting the findings in accessible language for the general public on health studies, clinical trials, and medical developments helps them understand the implications for health and medical practice. Overall, these forms of journalism, aid in educating the public about health issues, medical breakthroughs, findings and research advancements in healthcare.

**Journalism – Electronic Media**

Medical Journalism in Electronic Media refers to disseminating medical information through any digital platforms like broadcast news, websites, online publications, social media, podcasts and video channels. Many health-focused websites and blogs dedicate a portal for medical news. Likewise, social media platforms give importance to providing up-to-date coverage of health-related articles, and health tips by engaging with the audience through discussions. This form leverages the speed to reach a wide audience with the content. However, it also faces challenges such as ensuring the accuracy and credibility of online content, navigating misinformation, and maintaining ethical standards in digital reporting.

Medical journalism, a subspecialty of medical writing, is important because it aids in connecting the scientific community with the general public. Newspapers and magazines like the *Los Angeles Times* and *Scientific American* are well-known for publishing public-oriented articles on science and medicine. The goals of medical journalism accurately represent the research of scientists and doctors. The readers are entertained by providing unique discernment and insight. This journalism demands an investigative nature, the ability to disparagingly evaluate indication and the ability to hastily produce appealing reports of wide interest. It is a stimulating, fast-moving career, although often not a well-paid one. For those interested in medical journalism as a career, excellent writing skills and an ability to comprehend quickly are probably more important features than journalistic qualifications or deep knowledge. Websites such as *Columbia Journalism Review* and *Hippocrates Med Review* publish articles related to medical journalism. Foundations for evaluating healthcare media coverage embrace the review websites along with specialized academic journals such as the *Journal of Health Communication*. Reviews also appear in the *American Journal of Public Health*, the *Columbia Journalism Review*, Ben Goldacre's "Bad Science" column in *The Guardian*, and many others. Health News Review has published criteria for rating news stories. More lately, medical writers have become more prevalent as a way to harvest medical literature that is clear, succinct, and accessible to anyone.

**Medical Journalism in Novels**

Medical journalism in novels often serves as a vehicle for exploring medical issues, ethical dilemmas and patient or doctor experiences behind them. Novels that incorporate medical journalism often feature protagonists who are journalists or writers covering medical topics, investigations, or healthcare-related scandals. These novels can provide insights into the inner workings of the healthcare system, the challenges faced by healthcare professionals, and the impact of medical advancements on society. A few examples of novels that prominently feature medical journalism:

1. The non-fiction narrative, *The Immortal Life of Henrietta Lacks* by Rebecca Skloot explores the sto

ry of Henrietta Lacks, a poor African American woman whose cancer cells were taken without her consent and became the source of the HeLa cell line, which has contributed to numerous medical breakthroughs. Rebecca Skloot, a science journalist, investigates Henrietta's life, the ethical implications of her cells' use and the impact on her family.

2. The novel, *State of Wonder* by Ann Patchett follows a pharmaceutical researcher, Dr. Marina Singh, who travels to the Amazon rainforest to investigate the death of her colleague and to retrieve information about a drug being developed by their company. The story delves into themes of medical ethics, scientific exploration, and the clash between Western medicine and indigenous knowledge.
2. In *Cutting for Stone* by Abraham Verghese, the protagonist becomes a doctor and later a medical journalist. It follows the life of Marion Stone, who was born in an Ethiopian hospital run by missionary doctors. The novel explores themes of family, medicine, and the intertwining of personal and professional lives.
3. *The Andromeda Strain*, a science fiction thriller by Michael Crichton discusses a team of scientists investigating a deadly extraterrestrial microorganism that causes a small town's population to die suddenly. The story is presented as a case study report, with elements of medical journalism woven into the narrative, as the team races against time to understand and contain the threat. These novels showcase how medical journalism can be integrated into fictional narratives to explore a wide range of medical, ethical, and social issues. They offer readers a deeper understanding of the complexities of healthcare and the human stories behind medical breakthroughs and controversies.

This paper deals with the intersection of journalism into the novel *Red Madness: How a Medical Mystery Changed What We Eat* by Gail Jarrow. It is a non-fictional narrative that explores the history of Pellagra, a nutritional deficiency disease caused by a lack of the vitamin niacin (vitamin B3). The story is set in the early 20<sup>th</sup> century when Pellagra became a significant and puzzling health problem in the Southern United States. It created symptoms like dermatitis, diarrhoea and dementia, but these causes were unknown at that time. The novel shadows the efforts of scientists, researchers, and public health officials as they work to unravel the mystery of Pellagra and understand its root cause. Gail Jarrow explores the social and economic factors that contributed to the prevalence of Pellagra, particularly among penurious population who couldn't afford even three meals a day and were heavily dependent on corn. The discussions about the groundbreaking research that eventually identified niacin deficiency as the cause of Pellagra and examining the implications of this discovery in concerning the public health and nutrition policies can be observed in the novel. Throughout the narrative, the author highlights the challenges faced by that investigation and addresses the Pellagra epidemic. The story not only provides insights into the scientific aspects of the disease but also touches on broader issues related to poverty, nutrition, and public health in the early 20<sup>th</sup> century. Overall, it is a compelling non-fiction work that combines medical history, science, and social issues to tell the story of the medical mystery surrounding Pellagra and its impact on public health and nutrition.

Through this narrative, it is understood that the investigative reporting delves into the history of Pellagra and the exploration of the medical mystery surrounding the disease. Investigative journalism aims to uncover the hidden truths and provide a comprehensive understanding of complex issues. This is evident in the exploration of the causes and the effects of the disease. The novel also communicates scientific findings related to Pellagra, explaining the discovery of niacin deficiency as the cause of the disease. This aligns with the goal of medical journalism to make medical and scientific knowledge understandable to a broader audience. The book touches on reporting public health issues and policies,

discussing the social and economic factors contributing to the pervasiveness of Pellagra. Furthermore, the novel sees historical context for the understanding of nourishment and public health in the early 20<sup>th</sup> century. Thus, medical journalism frequently covers public health challenges, investigates their root causes, and discovers potential solutions. Understanding the historical context and insinuations of the Pellagra epidemic contributes to the broader discussion of public health. Overall, it sheds light on solutions to medical mysteries and influences on healthcare practices.

## Pellagra

Pellagra is a systematic disease caused by the deficiency of Niacin. It is characterised by 4D's – Dermatitis, Diarrhoea, Dementia and if untreated, Death. Primary Pellagra due to a deficient diet is particularly caused in developing countries where corn or maize is the major food source. Though corn is rich in niacin and corn is the foremost source of carbohydrates, it is in a bound form incapable of access unless treated with alkaline solutions. At the same time, the proteins in corn are low in tryptophan. Pellagra remains endemic in India, China and African countries. Pellagra can also be seen as the genetic condition of Hartnup disease as well as in association with carcinoid syndrome. Symptoms include inflamed skin and sores in the mouth. Areas unprotected from either sunlight or friction are affected first. Over-affected skin becomes darker, congeal and sometimes peels or bleeds. There are two types of Pellagra, primary and secondary. Primary Pellagra is due to the diet which doesn't contain enough niacin and tryptophan. Secondary Pellagra is due to a poor ability to use niacin within the diet. These diagnoses are based on symptoms and are assisted by testing urine.



**Fig.1.1. Deficiency of Niacin causing Pellagara (Vitamin B3)**

## Diarrhea (Gastrointestinal Mucositis)

Diarrhea befalls when the mucous lining of your intestines fails to replenish itself fast enough. Usually, without mucous, the intestines can't abridge properly and they cannot protect themselves from annoyance and soreness. Chronic inflammation affects the mucous lining along with the gastrointestinal tract from mouth to bowels. This gives symptoms like stomach pain, indigestion, and oral mucositis which includes mouth sores and swollen tongue.

## Dementia (Brain and Nerve damage)

Being a systematic disease, Pellagra affects the whole body's cells which deprives energy needed to perform bodily functions. This affects the brain and nervous system. Premature symptoms may be vague. They include lethargy, apathy, difficulty in concentrating, anxiety or depression. Later, the symptoms progress to confusion and delusions. Severe cases may lead to permanent dementia as well as

neurological damage resulting in balance and coordination problems, sometimes with muscle twitches and tremors.

### **Dermatitis (Skin Photosensitivity)**

A distinctive type of dermatitis particularly on sun-exposed areas of the body like the face, neck, arms, legs, feet and hands. The skin cells become more photosensitive. Dermatitis begins with rashes resembling sunburn which progresses to rough, scaly and hyperpigmented plaques. The dark hyperpigmented collar around the neck is called Casal's collar after the Spanish physician Don Gaspar Casal who first identified Pellagra among the Spanish peasants in 1735. Later, sometimes death may occur when not treated properly.



**Fig.1.2. Skin Photosensitivity due to Pellagra**

The treatment is with either niacin or nicotinamide supplementation. General improvements can be maintained with diet. Decreasing sun exposure by using sunscreen and proper clothing can heal the wounds. Without appropriate treatment, death may occur. Other common symptoms are hair loss, swelling, trouble in sleeping, weakness, mental aggression and a weakened heart. J. Frostings and Tom Spies, according to Cleary and Cleary (1989) describe the psychological symptoms of Pellagra as

1. Psychosensory disturbances: painful, annoying bright lights, odor intolerance causing nausea vomiting and dizziness after sudden movements.
2. Psychomotor disturbances: restlessness, tension and abnormal movements.
3. Emotional disturbances

The article "Pellagra in India" by Panja in Calcutta reports that Pellagra is rare in India. Last twelve years, Hindu widows more than age 40 manifested the three typical groups of symptoms as cutaneous, gastro-in-testinal and nervousness. In one case, a patient died of the disease despite treatment with vitamins and arsenic. In another case, the patient had the dorsal of the hands, feet and backs of the elbows thickened, darkly pigmented and scaly. But there was no disturbance in sensation. The patient had ulcers on the floor of the mouth, and salivation was so profuse that she could not sleep at night. At present, Pellagra in the United States is also rare, occurring in less than 1% and is due to secondary causes like with use of alcohol. Even in other Western nations, similar cases occur and many have adopted the practice of fortifying bread and cereal products. Nevertheless, primary pellagra still very much happens in less industrialized provinces of the world, especially tribal populaces where corn endures to be the staple. It's most commonly found in India, China and Sub-Saharan Africa today.

To diagnose the disease, the healthcare provider will examine by knowing the symptoms and medical history. When they suspect the disease is Pellagra, they may order a urine test to confirm it. Certain levels of chemicals in the urine identify if the body has enough niacin. It is cured by replacing the missing nutrient with niacin supplements. Sometimes, from the overdose of supplements taken, side effects can occur when a patient is deficient. Here, side effects can include skin flushing, itching, rashes, bloating, indigestion, headaches and dizziness. Occasionally, most people begin to improve in a few days. Gastrointestinal signs are the first to heal, usually within the first week. Skin and mouth sores instigate to heal within two weeks. Some progressive cases may take longer to heal. Severe nerve damage and dementia may be irreversible. Healthcare providers recommend preserving a balanced diet to prevent primary pellagra. Niacin deficiency often transpires with other micronutrient insufficiencies. These can all be amended with an adequate diet. Some people may need nutritional education or additional support. Secondary pellagra can be fiddlier to treat. Although supplements often help, they may not help enough if the body is incapable of metabolizing niacin effectively. Repossession in these cases depends on detaching and treating the underlying ailment that is causing pellagra. This can be a long process, depending on the condition.

### Theoretical Framework for Understanding the Disease

A theory provides a conceptual framework that generates new insights, fosters interdisciplinarity and mainly aids in supporting arguments. The term Social Determinants of Health (SDOH) refers to the social, economic, environmental and political factors that plays a significant role in influencing health outcomes and health disparities among populations. Addressing these determinants requires a comprehensive and holistic approach wherein each determinant is taken separately and analysed to promote inclusivity. The discussion of Pellagra in *Red Madness* aligns with the key principles of the Social Determinants of Health theory in several ways:

1. **Economic and Social Conditions:** Pellagra in impoverished inhabitants with diets heavily dependent on corn emphasizes the influence of economic and social conditions on health. Socio-economic factors, such as poverty and inadequate access to diverse and nutritious foods, played a decisive role during the development of Pellagra.
2. **Nutrition as a Social Determinant:** In this case, the book highlights how nutritional deficiencies, a lack of niacin, are linked to social conditions. The availability and affordability of a diverse and nutritious diet are shaped by socio-economic factors, impacting the health of individuals and communities.
3. **Health Inequities:** Pellagra unreasonably affected certain socio-economic groups, illustrating health discrimination. The Social Determinants of Health theory emphasizes that health disparities often result from inadequate distribution of resources, opportunities, and power within societies.

The Social Determinants of Health theory provides a framework for understanding the intersection of social, economic, political and environmental factors with health outcomes, as demonstrated by the discussion of Pellagra in *Red Madness*. The theory underscores the importance of considering broader societal factors when examining health issues and formulating effective public health strategies. Journalism plays a key role in helping the public understand the nature of Pellagra and its grounds. The novel *Red Madness* gives detailed account of the epidemic in a journalistic manner by including the real-life stories of Pellagra victims and also includes accounts of scientific investigations. The intensity of the book lies in the detailing of the meticulous research work done by Dr. Joseph Goldberger, who proved

that Pellagra was not contagious and it is caused by nutritional deficiencies, particularly a lack in niacin and protein-rich diet paved the way for the infection. Dr. Joseph Goldberger played significant role in investigating and reporting the root cause of the disease. Goldberger's investigative approach in finding the root cause of the disease gets a precise documentation through this work. The public had a belief that Pellagra was infectious or caused by germs. They researchers highlighted the role of poverty, malnutrition and dietary deficiencies in its development. The clinical reports of Dr. Joseph Goldberger helped to dispel myths surrounding Pellagra and reinvigorated public health officials and policymakers to act on it. With Goldberger's death in 1928, other scientist continued to search for the vitamin that would prevent the disease and eventually, Conrad Elvehjem discovered that nicotinic acid (niacin) can be used to treat Pellagra.

The book also addresses social determinants like poverty and education, which is also essential in preventing and managing diseases. The social determinants of health and medical journalism can be connected as the journalists play a crucial role in highlighting the social determinants of health. The complex medical information is given as engaging and in an accessible way to the public. So, the journalist clearly communicates to readers, emphasizing the importance of diet and socio-economic status in health. Along with social determinants, other concepts can be related. For which, medical journalism involves in exemplifying key aspects of *Red madness* on public health awareness. They are:

1. Medical Sociology
2. Kuhn's theory
3. Public Health and Policy theory
4. Narrative Medicine
5. Critical Medical Anthropology

Medical Journalism serves as the bridge between scientific discoveries and public understanding. This book highlights the societal factors that is critical to understand by general public. The journalist contextualizes the findings within the broader social landscape to help the public understand why certain populations were more vulnerable. They must balance scepticism with openness to new ideas and should provide context for certain scientific views and explain how it is evolved over time. *Red Madness* represents medical journalism can be used to inform, educate, and influence the public and policy-makers. By analyzing the book through these theoretical lenses, it is noted that medical journalists have the power to shape public understanding of health issues, advocate for susceptible populations, and push for changes in health policy and practice.

### **Connection to Medical Journalism:**

Dr. Goldberger's Research and Public Resistance: Jarrow describes the substantial public and systematic resistance that Dr. Joseph faced when he proposed that pellagra was caused by a dietary deficiency rather than an infectious disease. "Goldberger faced enormous opposition. Many doctors, scientists, and public officials were convinced that pellagra was caused by an infectious agent, and they refused to believe that something as simple as a lack of certain foods could be the culprit" (Jarrow). This moment in the book can be analyzed through Kuhn's Theory of Scientific Paradigms and Public Health and Policy Theory. As a medical journalist, reporting on this kind of controversy would involve explaining to the public on Goldberger's findings were groundbreaking.

So, A journalist might write an article discussing how new scientific findings often challenge established beliefs, drawing a parallel between Goldberger's work and more recent medical controversies (e.g.,

vaccine hesitancy or the debate over climate change). The journalist's role would be to provide balanced coverage, ensuring that the public understands the evidence supporting the new paradigm while also explaining the reasons for the resistance.

### **The Role of Poverty and Diet in Pellagra**

"The poorest people, often sharecroppers and tenant farmers, were the ones most likely to suffer from pellagra. Their diets were monotonous, consisting mainly of corn, which lacked the essential nutrients that could prevent the disease" [17]. Through these lines, he emphasizes the socio-economic conditions in the American South contributed to the pellagra epidemic.

This passage highlights the Social Determinants of Health and linked to Medical Sociology. A medical journalist might use this information to write on social and economic factors that contributes to modern health crises. So, connections between historical cases like pellagra and current issues such as food deserts or the rise in diet-related illnesses among low-income populations. The journalist would explain how economic hardship limits access to a diverse diet, leading to health disparities, and might advocate for policies that address these social determinants.

### **Narrative Approach to Public Health Awareness**

Jarrow uses narrative storytelling to make the history of pellagra engaging and accessible, "through the eyes of those who lived with pellagra, the reader gets a sense of the fear and despair that gripped entire communities" [17]. This narrative approach is closely related to Narrative Medicine and its role in Medical Journalism. The use of personal stories and vivid descriptions helps the audience understand the human impact of the disease. So, here a journalist might use a similar narrative technique to write a feature story on a current public health issue, such as the opioid crisis or the impact of COVID-19 on vulnerable communities. By focusing on individual stories, the journalist can create empathy and a deeper understanding among readers, making the issue more relatable and urgent.

### **Goldberger's Success and Policy Change**

The book details how Goldberger's persistence eventually led to changes in public health policy. As, mentioned in *Red Madness*: "Thanks to Goldberger's efforts, the federal government finally began to address the nutritional deficiencies in the diets of the poor. Programs were developed to supplement diets with foods rich in niacin, dramatically reducing the incidence of pellagra" [17]. This outcome can be analyzed through Public Health and Policy Theory. Medical journalists play a critical role in reporting on how scientific findings lead to policy changes that improve public health. So, a journalist might cover the development and impact of public health programs, drawing parallels between Goldberger's work and contemporary initiatives like food assistance programs or nutrition education campaigns. The article would not only inform the public but also highlight the importance of continued support for such programs. Thus, by following all this, a journalist would fulfil the role of making complex medical history accessible, relevant, and impactful for contemporary readers.

### **Conclusion**

*Red Madness* by Gail Jarrow serves as a powerful example of the role of effective communication in medical journalism which bridges the gap between complex scientific discoveries and public understanding. The book illustrates Dr. Joseph Goldberger's research on pellagra faced resistance due to

entrenched beliefs, like journalists at the contemporary world must clearly explain paradigm shifts in medicine to help the public navigate new information. By using narrative storytelling and highlighting the social determinants of health, the book underscores the importance of making medical history relatable and urgent. For medical journalists, this means not only reporting facts but also crafting compelling stories that emphasize the human impact of health issues, advocate for informed public policies, and ultimately, drive positive change.

## References

1. "Medical Journalism." Wikipedia, Wikimedia Foundation, 3 Dec. 2023, [en.wikipedia.org/wiki/Medical\\_journalism](https://en.wikipedia.org/wiki/Medical_journalism).
2. "Medical Journalism." Wikipedia, Wikimedia Foundation, 3 Dec. 2023, [en.wikipedia.org/wiki/Medical\\_journalism](https://en.wikipedia.org/wiki/Medical_journalism).
3. "Red Madness: How a Medical Mystery Changed What We Eat." Blue Ribbon Book Fairs, [read-ola.com/red-madness-how-a-medical-mystery-changed-what-we-eat/](https://read-ola.com/red-madness-how-a-medical-mystery-changed-what-we-eat/). Accessed 30 Aug. 2024.
4. "Red Madness: How a Medical Mystery Changed What We Eat." Blue Ribbon Book Fairs, [read-ola.com/red-madness-how-a-medical-mystery-changed-what-we-eat/](https://read-ola.com/red-madness-how-a-medical-mystery-changed-what-we-eat/). Accessed 30 Aug. 2024.
5. "The Andromeda Strain." Michael Crichton, 3 Feb. 2023, [www.michaelcrichton.com/works/the-andromeda-strain/](http://www.michaelcrichton.com/works/the-andromeda-strain/).
6. "The Immortal Life of Henrietta Lacks." Wikipedia, Wikimedia Foundation, 16 Aug. 2024, [en.wikipedia.org/wiki/The\\_Immortal\\_Life\\_of\\_Henrietta\\_Lacks](https://en.wikipedia.org/wiki/The_Immortal_Life_of_Henrietta_Lacks).
7. Bush, Elizabeth. "Red Madness: How a Medical Mystery Changed What We Eat by Gail Jarrow (Review)." Bulletin of the Center for Children's Books, Johns Hopkins University Press, 26 Mar. 2014, [muse.jhu.edu/pub/1/article/541220/pdf](https://muse.jhu.edu/pub/1/article/541220/pdf).
8. Dowling, Cecilia. State of Wonder by Ann Patchett: Notes. CAE Book Groups, 2012.
9. Dr. Charles Platkin, PhD. "Food Fighting and Curing Disease Series: Pellagra." Center For Food As Medicine, 3 Sept. 2023, [foodmedcenter.org/food-fighting-and-curing-disease-series-pellagra/](https://foodmedcenter.org/food-fighting-and-curing-disease-series-pellagra/).
10. G;, López D;Otero. "[Pellagra: An Ancient Disease in a Modern World]." Nutricion Hospitalaria, U.S. National Library of Medicine, [pubmed.ncbi.nlm.nih.gov/33720743/](https://pubmed.ncbi.nlm.nih.gov/33720743/). Accessed 21 Aug. 2024.
11. JARROW, Gail. "Red Madness: How a Medical Mystery Changed What We Eat." School Library Journal, [www.slj.com/review/red-madness-how-a-medical-mystery-changed-what-we-eat](https://www.slj.com/review/red-madness-how-a-medical-mystery-changed-what-we-eat). Accessed 30 Aug. 2024.
12. Jarrow, Gail. Red Madness: How a Medical Mystery Changed What We Eat. Calkins Creek, 2014.
13. The Guardian, Guardian News and Media, [www.theguardian.com/education/medicine](https://www.theguardian.com/education/medicine). Accessed 30 Aug. 2024.
14. The Impact and Challenges of Medical Journalism: A Review, [www.researchgate.net/publication/346313231\\_The\\_Impact\\_and\\_Challenges\\_of\\_Medical\\_Journalism\\_A\\_Review](https://www.researchgate.net/publication/346313231_The_Impact_and_Challenges_of_Medical_Journalism_A_Review). Accessed 22 Aug. 2024.
15. "Pellagra: Definition, Symptoms & Treatment." Cleveland Clinic, 1 May 2024, [my.clevelandclinic.org/health/diseases/23905-pellagra](https://my.clevelandclinic.org/health/diseases/23905-pellagra).
16. M. Jones a b c e, et al. "Adapting Public Policy Theory for Public Health Research: A Framework to Understand the Development of National Policies on Global Health." Social Science & Medicine, Pergamon, 24 Jan. 2017, [www.sciencedirect.com/science/article/abs/pii/S0277953617300552](https://www.sciencedirect.com/science/article/abs/pii/S0277953617300552).

17. Ledade, Samir D, et al. "Narrative Writing: Effective Ways and Best Practices." Perspectives in Clinical Research, U.S. National Library of Medicine, 2017, [www.ncbi.nlm.nih.gov/pmc/articles/PMC5384400/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC5384400/).
18. "Niacin Deficiency: Symptoms, Causes, and Treatment." WebMD, WebMD, [www.webmd.com/diet/niacin-deficiency-symptoms-and-treatments](http://www.webmd.com/diet/niacin-deficiency-symptoms-and-treatments). Accessed 31 Sept. 2024.
19. "Pellagra (Vitamin B3 or Niacin Deficiency)." DermNet®, 23 May 2024, [dermnetnz.org/topics/pellagra](http://dermnetnz.org/topics/pellagra).
20. "Social Determinants of Health: Definition, Influence, Outcomes." Medical News Today, MediLexicon International, [www.medicalnewstoday.com/articles/social-determinants-of-health#overview](http://www.medicalnewstoday.com/articles/social-determinants-of-health#overview). Accessed 1 Sept. 2024.