# Medical Anthropology

MARK NICHTER
University of Arizona, USA

SJAAK VAN DER GEEST
University of Amsterdam, The Netherlands

This overview of medical anthropology provides a brief history of the subdiscipline pre-1980, followed by an introduction to prominent conceptual frameworks adopted by medical anthropologists over the next four decades, and new frontiers currently being engaged in response to scientific breakthroughs, paradigm shifts, and societal challenges.

Medical anthropology is the study of how health and illness are shaped, experienced, and understood within the context of social, cultural, economic, and political forces. As a subfield of anthropology, the purview of medical anthropology is broad. It encompasses the anthropology of the situated and relational body in its physical, social, and cultural environments; ethnomedicine broadly conceived to include cultural interpretations of health, diseases, and illness and all forms of healing, anthropology of public health, medicine, and medical systems (critical medical anthropology); anthropology in the health sciences (applied medical anthropology in clinical and community health care settings), and engaged medical anthropology which is at once critical yet constructive, anticipatory and guided by pragmatic melioration.

Medical anthropology both draws upon and contributes to sociocultural, biocultural, and linguistic anthropology as well as science and technology studies, political ecology, and studies of gender and generation. For instance, it contributes to sociocultural anthropology by documenting how notions of disease causality reflect ideology and cosmology as they are lived in local worlds. Each of these branches of anthropology contributes to medical anthropology by providing broader social, linguistic, environmental, and technological contexts for understanding health-related phenomena. Rather than contributing to the balkanization of anthropology, medical anthropology provides a nexus for synthesis and a meeting ground for many different theoretical orientations.

The units of analysis employed in medical anthropology range from the individual and the household to the community, the state, and global formations, to emergent virtual networks. Multiple qualitative methods are employed by medical anthropologists, and both methods and theory triangulation are encouraged. In general, far more attention is placed on exploring the range and depth of health-related perceptions and practices than the prevalence. However, medical anthropologists are attentive to quantitative studies such as those documenting the (mal)distribution of health problems and disparities in access to health resources resulting from inequalities in larger sociopolitical environments.

Medical anthropology is one of the most robust and fastest growing subfields in anthropology. Its breadth is seen in the number of special interest groups that play an active role in the American Society for Medical Anthropology (text box).

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- AARG: *AIDS and Anthropology Research Group*
- ADTSG: *Alcohol, Drug, and Tobacco Study Group*
- AMHIG: *Anthropology and Mental Health Interest Group*
- ARHE: *Anthropological Responses to Health Emergencies*
- CAGH: *Critical Anthropology for Global Health Study Group*
- CAM/IM: *Complementary and Alternative Medicine (CAM) and Integrative Medicine (IM) Group*
- CAR: *Council on Anthropology and Reproduction*
- DRIG: *Disability Research Interest Group*
- DABIG: *Dying and Bereavement Interest Group*
- MASA: *Medical Anthropology Students Association*
- RUSH: *Research on U.S. Health and Healthcare*
- STM: *Science, Technology, and Medicine Group*

## BRIEF OVERVIEW OF MEDICAL ANTHROPOLOGY

### Early period: pre-1980

In the first handbook of medical anthropology, Foster and Anderson (1978) identified four predecessors of medical anthropology: physical anthropology, ethnomedicine, culture and personality studies, and international public health. The foci of **physical anthropology** are the origin, evolution, and diversity of people, the biological bases of human behavior, and adaptations to environmental stresses. In the colonial period, physical anthropologists played a central role in justifying theories of evolution that suggested that stages of physical and psychic evolution exist. This supported racist ideas that rationalized the colonial enterprise and the exploitation of "less civilized and evolved" societies. Social evolution was debunked by anthropologists at the turn of the century.

Ethnomedicine, in its early stages, entailed the study of indigenous beliefs and practices related to health, illness, and healing. The term "indigenous" referred to "non-Western" cultures and excluded ideas and practices within biomedicine. Most early ethnomedical studies investigated religious and magical beliefs associated with illness causality and analyzed ritual practices used in healing as attempts to resolve conflict and restore harmony in local worlds.

The work of W. H. R. Rivers (1924), considered the father of medical anthropology, was among the first to study local medical traditions as an integral part of culture. Groundbreaking early ethnographies included Evans-Pritchard's (1937) study of Azande witchcraft, oracles, and magic, and Victor Turner's (1967) description of Ndembu divination rituals. The purview of ethnomedicine expanded significantly in the years to come informed by advances in anthropological theory, placebo studies, recognition that biomedicine needed to be studied as another form of ethnomedicine, and newfound appreciation for the scientific merits of Complementary and Alternative Medicine (Nichter 1992).

The "culture and personality" school thrived during the 1930s and 1940s in American cultural anthropology. Prominent anthropologists included Ruth Benedict (1887–1948), and Margaret Mead (1901–1978). As proponents of cultural relativism, these anthropologists argued that nurture (culture) was more important in shaping individuals than nature. Each culture was seen as elaborating a particular emotional and motivational disposition (a cultural personality writ large) that molded the personality of its members. An infinite range (arc) of potential ways of being existed. In each culture, some personality traits are celebrated, and others suppressed in ways that have nothing to do with social evolution a theory roundly rejected. As such, it was argued that there was no universal standard by

which to judge what was normal or abnormal, advanced, or primitive. The thinking of this school influenced future medical anthropology studies of mental health and culturally distinct expressions of distress.

Anthropology in the service of international health has a long history. In North America, exemplars include Benjamin Paul (1911–2005), Charles J. Erasmus (1921–2012), Stephen Polgar (1931–1978), and George M. Foster (1913–2006). These anthropologists documented local health perceptions and practices that could potentially conflict with and undermine biomedical public health messages and interventions. These early studies were the forebearers of decades of ethnographies focusing on diseases ranging from diarrhea and acute respiratory infection to malaria, tuberculosis, and sexually transmitted diseases to noncommunicable diseases such as diabetes and hypertension, neglected emerging diseases and studies of family planning, and vaccinations to other technical fixes for public health problems. Over time global health became one of the most robust domains of broad-based medical anthropological investigation (Janes and Corbett 2009).

Notably, Foster and Anderson's characterization of early anthropology was North American-centric (cf. Saillant and Genest 2007) and overlooked valuable contributions from European scholars such as Rudolf Virchow (1821–1902). Virchow, a medical doctor and cellular biologist by training, played a major role in the history of German cultural anthropology and archaeology as well as being the founding father of social medicine of relevance to medical anthropology. He was one of the first to draw attention to the socioeconomic and political determinants of health. His work inspired critical medical anthropology.

Also in Germany, a group of medical doctors and biologists, sometimes referred to as "the Heidelberg School," began to rethink the biomedical principles of their work. Among them were Viktor von Weizsäcker (1886–1957), Herbert Plügge (1906–73), Thure von Uexküll (1908–2004), and the Dutch physiologist and psychologist Frederik J. J. Buytendijk (1887–1974). In their reflections, they criticized various dichotomies that had become commonplace in biomedicine: Cartesian dualism, the separation of theory and empirical observation, and the separation of subject and object. Von Weizsäcker argued against the dominance of biomedicine and its physicalist concept of disease; he saw disease as a meaningful sign of human distress – an expression of unsolved conflicts. He also emphasized the importance of the total context of ill-health. Illness takes place in the pathology of family, marriage, upbringing, and work, as he put it.

Three general observations may be made concerning medical anthropology before the 1980s. First, anthropologists tended to study the health beliefs and practices of societies outside of their own. Second, they treated biomedicine as science and not culture in ways that today are considered ethnocentric. Third, indigenous medical practices tended to be treated as "just cultural" and not taken seriously in terms of having any modern scientific merit.

Medical anthropology came of age during the late 1970s when it was established as a new subdiscipline within anthropology. New introductions to cultural and biocultural approaches to this nascent field emerged (Foster and Anderson 1978; McElroy and Townsend 1979) and an influential reader edited by David Landy (1977) provided case studies that broadened the scope of medical anthropology. Charles Leslie's (1976) edited volume on Asian medicine stimulated the comparative study of medical systems, and John Janzen's book *The Quest for Therapy in Lower Zaire* (1978) and Arthur Kleinman's (1980) study of diverse medical practitioners in Taiwan generated interest in patterns of health care seeking in pluralistic health-care arenas.

New medical anthropology-oriented journals and journal sections also appeared. In 1964, *Transcultural Psychiatry* was launched

in Canada. From 1968 to 1982, the American Anthropology Association produced its first **Medical Anthropology Newsletter which evolved to become its Flagship journal *Medical Anthropology Quarterly* in 1983.** In 1977, Charles Leslie became editor of the journal *Social Science & Medicine* which opened its doors to medical anthropological work and Arthur Kleinman founded the journal *Culture, Medicine, and Psychiatry*. The same year the journals *Medical Anthropology* and *Curare* (Germany) were launched. Other journals soon followed, such as *Kallawaya: Órgano del Instituto Antropológico de Investigaciones en Medicina Tradicional* (Argentina, 1985), *Medische Antropologie* (the Netherlands, 1989) *Anthropology & Medicine* (UK, 1992), *Revista della Società Italiana di Antropologia Medica* (Italy, 1996), and *Medicina y Ciencias Sociales* (Spain, 1993). Medical anthropology also started being integrated into medical training programs. For example, in 1984, Cecil Helman published an introduction to medical anthropology for health professionals that was soon to become one of the most widely read handbooks used in more than 40 countries in medical schools and nursing colleges.

### Medical anthropology post-1980

Post-1980, medical anthropologists employed a diverse array of theoretical lenses in the investigations of health-related phenomena in community and clinical-based settings both nationally and internationally. In the short overview that follows, we highlight a few of the more prominent conceptual frameworks adopted by medical anthropologists. These include approaches inspired by ecological, meaning-centered, embodiment and agency-focused, and political-economic theories. Many medical anthropologists adopted and blended theoretical approaches.

***Ecologically inspired studies*** Ecologically oriented (medical) anthropologists view culture through the lens of human adaptation in an ever-changing environment. Health is regarded as the result of successful adaptation to environmental challenges while sickness results from either maladaptation or exposure to ecological disturbances that make adaptation problematic. Because the human body is continually exposed to environmental stressors, and because human evolution organism is slow, cultural adaptation assists, compensates, or replaces physiological adaptation, and is believed to affect genetic adaptation in the long run (cf. McElroy and Townsend 1979).

Many ecology-oriented anthropologists have investigated factors leading to shifts in demographic, epidemiological, and nutritional transitions. They often work in concert with biologists and other natural scientists largely embracing a positivist approach to science based on hypothesis testing. Examples of issues investigated include the bioavailability of nutrients as influenced by the mixture of foods eaten in different societies, the relation between nutritional deficiencies/excesses and patterns of disease across the human life course, and biosocial factors involved in how diseases are transmitted. An early example of the latter is the blended anthropological investigations of *kuru*, a mysterious neurological disease in Papua New Guinea by Shirley Lindenbaum. Ecological and cultural investigation elucidated the origin and transmission of this prion disease and its relationship to local mortuary practices of endocannibalism (the eating of dead members of one's own social group).

Ecology-oriented anthropologists also began researching the biological effects of privilege and deprivation on susceptibility to infectious disease, work capacity, social mobility, and reproductive performance. Studies of how poverty and poor health were mutually constitutive (Leatherman 2005; Thomas 1998) led to a critical biocultural approach to medical anthropology that embraced political economic studies of ill health and shed light on the biology of poverty and social inequity.

***Meaning-centered studies*** Interpretive, experience-near, and semiotic/symbolic approaches

to medical anthropology draw upon phenomenology, hermeneutics, and semiotics. This approach investigates health, illness, treatment, and care as meaningful experiences from the "native's point of view". Foundational to this approach is an important distinction made between "illness," "disease," and "sickness" (Hahn 1984; Young 1982), stated succinctly by Eisenberg (1977): "Patients suffer 'illnesses'; physicians diagnose and treat 'diseases'." Illnesses are subjective experiences of devalued changes in states of being and social function. Diseases are disorders and abnormalities diagnosed by a medical system based on inclusion and exclusion criteria of some type. As such, one may have an illness and not a disease, and vice versa. The diagnosis of disease differs by medical system and tradition. In the biomedical system, diseases are abnormalities in the structure and function of body organs and systems, while in Asian medical systems, they are based on imbalances of bodily humors. Some degree of confusion has resulted from ethnocentric use of the term "disease," to describe universal states, juxtaposed to "illness" being in the mind of the layperson.

Over time, the illness–disease distinction has proved invaluable in the study of practitioner–patient communication and clinic-based interventions designed to enhance cultural sensitivity toward the goal of treatment adherence. The concept of sickness differs from subjective accounts of illness and entails the social relations of being ill inclusive of the sick role (and risk role) one is expected to adopt within one's culture and all this entails. As a public mode, sickness is negotiated in society with various ailments (diseases and illnesses) afforded differing degrees of social credibility.

Explanatory models (EMs) are another core concept in meaning-centered medical anthropology. The concept was first introduced by psychiatrist–anthropologist Arthur Kleinman (1980) as a tool for understanding illness and disease. Different actors in medical encounters develop their understanding of health-related phenomena in accord with previous experience, cultural perceptions and concerns, and interpretations of new information. EMs are at once referential and indexical in that they draw upon well-known (objectified) cultural explanations as well as fuzzy sets of associations (ideas, feelings, experiences) that can be highly "symbolic" and comprise one's semantic illness network (Good 1977). Semantic illness networks are at once cultural and idiosyncratic. They are the *Gestalt* from which ad hoc EMs are constructed and revised.

Anthropologists conducting research in clinical settings have made frequent use of EMs as have medical practitioners who have adopted this conceptual model for their clinical routines. Other anthropologists have deepened meaning-centered thinking about EMs. For example, Allan Young has pointed out that EMs entail the production of several different types of knowledge inclusive of intersubjective knowledge produced to make sense to whomever one is communicating, rationalized knowledge that an interlocutor finds psychologically satisfying and ontologically consistent, and negotiated knowledge created during an interaction (Young 1981). EMs of medications also influence the way people interpret their illnesses. Scores of medical anthropologists studying pharmaceutical practice have found that perceptions of medications (their strength and properties) are influenced by myriad factors ranging from the color and taste of medication and how it is administered to its demonstration effect and how bodily sensations related to its use are interpreted culturally, the marketing of medications and bracket creep to pharmaceuticalization of life (Ecks 2014; Hardon and Sanabria 2017; Whitmarsh 2008; Whyte et al. 2002). Perceptions of medicines matter as much as perceptions of causality in many instances.

Illness narratives have become an important meaning-centered method for gathering insights into the existential experience of illness and its treatment. Narratives allow interlocutors maximum freedom to tell and elaborate

on their personal history and somatic, social, and emotional experiences (Kleinman 1988; Mattingly 1998). Narrativization provides a process by which an inchoate experience of illness is reframed to have some semblance of coherence and meaning. This entails adopting a subjunctive mode of thinking that traffics in "what-if possibilities" that often involves what Gananath Obeyesekere has termed the "work of culture." The work of culture refers to the process whereby distressful states, perceived risks and motives, negative affections, and sensations are transformed into publicly accepted sets of meanings and symbols that can be manipulated in a culturally salient manner.

Notably, medical anthropologists have found that narratives do more than reflect on past events; they are performative acts created in the process of relationship building. Furthermore, they are typically populated by several different voices representing differing positions that people occupy in their lifeworld and the multiple audiences (seen and unseen) utterances are directed toward. Viewed as verbal performances and "accounts," illness narratives at once report, rationalize, and "defend" a speaker's moral identity and interests. "Public accounts" tend to comply with and confirm accepted social norms while "private accounts" reveal the personal experiences and further the interests of the speaker.

Treatment narratives have also been studied by meaning-centered anthropologists as a component of healing and doctoring. Medical anthropologists have observed that before the work of narratization, a person's understanding of an acute or chronic illness is often fragmentary, unsettling, and demoralizing. Both healers and doctors attempt to establish coherence and remoralization through narratives that can sometimes, but not always, provide relief from suffering on the part of the afflicted or family members.

For example, Cheryl Mattingly has studied therapeutic emplotment in clinical settings and the creation of intentional narratives. Such narratives are prospective and provide patients with a sense of agency in their lives despite the unpredictability of possible clinical outcomes. Laurence Kirmayer (1994) describes the production of treatment narratives as a work in progress that requires striking a balance between authority and improvisation. Two needs must be addressed, a need to diminish the threat of the inchoate while allowing enough ambiguity for improvisation. Arthur Kleinman has described the commitment to listen to sick persons and facilitate their building of an illness narrative as empathetic witnessing. He also offers an important caveat to both clinicians and anthropologists who study human suffering. There are instances where suffering has no meaning and feelings like guilt teach society lessons. In such cases, narratives index human tragedy and moral distress or injury in need of acknowledgment and societal reflection.

Beyond investigating illness narratives, meaning-centered anthropologists have also paid close attention to the way analogies, metaphors, and other tropes are used to frame representations of the body- and health-related experiences in society at large. For example, Emily Martin (1987) has analyzed the way human reproduction is framed within biomedicine, drawing attention to how gender bias is entrenched in language. Martin documented descriptions of women's physiology in biomedical textbooks using production metaphors that privilege childbirth above other aspects of a woman's health. Given this framing, menstruation comes to be seen negatively as a process involving failed production, waste products, and debris; and menopause as a time of decline instead of other possible and more positive interpretations of this life stage. Other medical anthropologists have examined how describing the body as a machine metaphor has led to the commodification, mechanization, and objectification of the body.

Meaning-centered anthropologists have further investigated the widespread use of bodily symptoms that resonate with and evoke cultural metaphors to describe both individual

and collective psychosocial distress (Nichter 2010). In contrast to a psychosomatic approach to understanding symptoms of distress in psychodynamic terms, they have adopted a sociodramatic approach that ties polysemic somatic symptoms to social relational problems. This approach views somatization as a normal part of communication within any culture's sociosomatic reticulum (Jenkins and Cofresi 1998). As such, the meanings associated with metaphor use extend beyond representation to presentation, and communication of sensory and affective as well as conceptual meanings.

The limitations of meaning-centered studies have also been pointed out by medical anthropologists. An example is the research of Annemarie Mol (2002) who emphasizes what disease becomes through practice in different clinical contexts. Her relational approach, much in line with science and technology studies, privileges how objects are brought into and become multiple through both constellations of practices and contingencies that render them stable or unstable. Bodies are enacted and rendered significant in relation to clinical norms and standards which are themselves historical artifacts.

***Embodiment and agency*** The paradigm of embodiment has played a significant role in the evolution of medical anthropology from an early interest in the relationship between ethnophysiology and cosmology (microcosm: macrocosm) to the use of the body as a natural symbol for social categories that reflect social structure to the embodiment of ideology, power relations, and forms of oppression. One of the first articles to draw attention to embodiment and body politic was Nancy Scheper Hughes and Margaret Lock's "The Mindful Body: a Prolegomenon to Future Work in Medical Anthropology" (1987), published in the first volume of Medical Anthropology Quarterly. They summarized contributions from three extant perspectives: a phenomenologically experienced individual body-self, a social body, and a body politic as an artifact of social and political control. The mindful body concept they present is based on the premise that our bodies are at once naturally and culturally produced, a conceptual framework that rejects cartesian mind: body dualism.

The writings of French social theorists Pierre Bourdieu and Michel Foucault are drawn upon in this foundational article to theorize about two distinct ways of studying embodiment. The first focuses on an individual's embodied experience employing a phenomenological lens and, the second, embodied representations using a post-structuralist framework. Given that these theories have played a major role in critical approaches to medical anthropology, they are briefly worth visiting.

In short, Bourdieu argued that we embody the cultivated dispositions of the social milieu in which we live reflecting such things as our class position, social status, level of education, and the ideologies to which we are exposed. Our Habitus (socially conditioned, patterned way of acting in particular social domains – fields) is at once structured and structuring, in the sense that routine practices are generative of future choices and improvisations. Social practices structured by habitus are enabled by various forms of accumulated capital (economic, cultural, social, and symbolic capital). These forms of capital, derived through various types of labor, are convertible and a means of achieving well-being when appropriately distributed.

Medical anthropologists have applied Bourdieu's theory to advance our understanding of health-related lifestyles. For example, biocultural medical anthropologist William Dressler has drawn upon Bourdieu in his studies of lifestyle congruity and what happens when cultural consonance – one's ability to attain a preferred style – is undermined by structural constraints and deficits of capital. Dressler ties lifestyle incongruity and loss of a sense of belonging to such basic measures of health as blood pressure and diabetes (Dressler 2001).

Other medical anthropologists have employed Bourdieu's concept of field in studies of clinical encounters as a means to better understand the differing orientations patients and doctors bring to the clinic. Attention is paid to embodied dispositions in addition to emergent explanatory models. Bourdieu has further been drawn upon to study social distinctions expressed at the site of the body through such things as aesthetics, taste and dietary choices, style of dress, body image, and behaviors particular to a given social class. For example, Charles Briggs (2005) draws upon both Bourdieu and Foucault in his study of communicability (the production, circulation, and value-oriented directives) of mainstream public health messaging in Latin America and how differences indexed can contribute to racism.

Juxtaposed to Bourdieu's emphasis on experience is Foucault's theory of embodiment which emphasizes how the body is subjected to norms through knowledge production which becomes a means of subject-formation. Governance is achieved through truth claims and ordering the way we know things**.** In short**,** in everyday life, knowledge production leads to a desire to conform to norms deemed "befitting" at a particular historical moment. Techniques of normalization exert their power by getting people to think and talk about themselves in relation to desired standards even when they do not actively engage in meeting these standards.

Foucault's call for a critical examination of the scientization of life as the exercise of productive power (biopower) has been taken up by medical anthropologists who have studied both how populations and individuals become subject to scientific disciplines that establish norms and standards. These knowledge-producing disciplines range from demography (which establishes normative birth rates and compares mortality rates) to clinical medicine (which establishes biological standards through the medical gaze of diagnostic tests, the calculation of risks, and so on). Examples of research inspired by Foucault range from studies of the subordination of women's body knowledge to the authority of medical professionals when it comes to such things as childbirth and breastfeeding (Millard 1990; Davis-Floyd and Sargent 1997), the ramifications of using body surveillance technologies as a means self-discipline (e.g., weight monitoring, use of wearable artificial intelligence devices) to the consequences of using quantitative metrics in public and global health (Adams 2016). Anthropologists inspired by both Foucault and STS examine the biopolitics of body representations (data doubles) produced by medical tests and artificial intelligence from both the vantage point of patients and practitioners subject to the standards of evidence-based medicine (clinical epidemiology) and insurance companies (Ruckenstein and Schüll 2017).

It is beyond the scope of this overview to examine the limitations of these theoretical frameworks when studying articulations of agency, autonomy, and resistance except to say that agency involves more than improvisation within existing structures. It also entails resistance to forms of biopower. Anthropologists have long observed that people do not always comply with social norms and reject expert knowledge – something clearly seen during the recent COVID-19 pandemic.

Agency takes many forms from employing what Scott (1985) has termed weapons of the weak (e.g., colonial mimicry, false or exaggerated compliance and subservience, rumor, and foot-dragging) to embracing alternative knowledge structures – or their representations as symbolic gesture. Examples of medical anthropological studies that address agency and resistance include investigations of the popularity of Complementary and Alternative Medicine use, self-medication, vaccine denial, and rejection of diagnostic labels.

***Critical medical anthropology*** Critical medical anthropology (CMA) is informed by embodiment, political economic, and dependency theories that shed light on social and

structural determinants of health, the spread of disease, and inequities in healthcare delivery (Frankenberg 1980; Morgan 1987; Nguyen and Peschard 2003; Singer and Baer 1995). Social epidemiological studies have long documented statistical associations between rates of morbidity and mortality, and class, race, and other social divisions. CMA investigates who and what is responsible for disease distribution and the ways poverty, discrimination, social violence, industrial pollution, commerciogenic malnutrition, exploitive sales of drugs and pesticides, etc. contribute to poor health among structurally vulnerable groups. It further studies disparities in access to and the quality of health care provided to the poor.

An example is the research by Paul Farmer and Jim Kim (founders of the NGO "Partners in Health") on TB and AIDS which lays bare the role played by poverty in the spread of emerging and remerging diseases. In his book *Infections and Inequalities* (2001), Farmer questions why certain people die of infections such as tuberculosis, AIDS, and malaria while others are spared this risk. The answer he suggests is not just poverty, but social inequality and structural violence. Although Farmer conducted meaning-centered ethnographic research on these diseases, he concludes that overemphasis on cultural perceptions of diseases distracts attention from political–economic factors leading to risk and the social interventions needed to "cure" the afflicted and control the spread of disease. Farmer and Kim's social justice and human rights-oriented research has inspired many anthropological studies of structural violence and structural vulnerability, such as Didier Fassin's (2007) study of the politics of AIDS in South Africa.

Studies of structural violence illuminate ways health and economic inequality are outcomes of social structures, institutions, and policies that systematically block members of a population from meeting basic needs, resulting in ill-health and premature death. Medical anthropologists have studied both the short- and long-term impacts of structural violence, given that the cumulative effects of unhealthy environments may take years to manifest among marginalized populations.

Structural vulnerability is related to social positionality as a determinant of negative health outcomes. One's place in a hierarchical social order due to such things as ethnicity, skin color, gender, citizenship or lack thereof, influences external perceptions of entitlement and worthiness as well as internal perceptions of deservedness. When this occurs, and exploited and subordinated individuals and collectivities embody their depreciated status, they suffer from "symbolic violence."

Medical anthropologists have employed the concept of structural vulnerability in examinations of exclusionary policies and institutions that result in poor health outcomes for groups like undocumented migrant workers (Larchanché 2012; Quesada et al. 2011). They have also pointed out how the ill-health of these groups affects populations at large given that contagious diseases know no borders.

CMA draws upon dependency and world systems theories in examining global capitalism as a social and structural determinant of health (Baer et al. 2003). These theories have inspired investigations of defective modernization, the negative impact of international aid from wealthier to poorer countries leading to the forced implementation of austerity measures, crises of debt and wasteful spending, and unhealthy health policies (Castro and Singer 2004).

James Pfeiffer and Rachael Chapman (2010) provide apt examples of a global health debacle in their investigations of the unforeseen impacts of neoliberal World Bank structural adjustment policies (SAPs) that promote the privatization of health care. They document how neoliberal policies favoring linear health-care programs and clinics run by NGOs (in the name of effectiveness and efficiency) resulted in the creation of a parallel, better-funded system of private NGO-run clinics and projects in Mozambique.

This undermined the government's primary health-care system. Studies such as these are part of anthropology's contribution to health service research which encompasses hospital ethnography (Olsen and Sargent 2022; Van der Geest and Finkler 2004), health systems (Closser et al. 2022; Pfeiffer and Nichter 2008), and global health programs that promote technical fixes with little regard to context (Parker and Allen 2014).

The concept of syndemics is another major contribution of CMA that has been widely adopted by medical anthropologists. As conceptualized by Merrill Singer (2009), syndemics were initially a response to a call for research on concurrent epidemics. Singer drew attention to health problems that interact synergistically to the extent that they cannot be analyzed individually or in parallel. They rather need to be seen as indivisible elements of a larger phenomenon produced by social, environmental, and economic problems facing vulnerable populations. To prevent or control a syndemic, it is not enough to attend to co-occurring afflictions through targeted linear programs. Instead, one needs to attend to the adverse forces that tie afflictions together in environments of risk.

Scores of syndemic-related studies have been conducted by medical anthropologists ranging from studies of the synergy between substance abuse, violence, and sexually transmitted disease to noncommunicable disease syndemics related to poverty: depression, poor access to health care, and commerciogenic factors related to foods available to the poor (Weaver and Mendenhall 2014).

## NEW FRONTIERS IN MEDICAL ANTHROPOLOGY

Medical anthropology is a rapidly evolving field of inquiry responsive to emerging social science theories, scientific breakthroughs and paradigm shifts, and societal challenges. In closing, we briefly highlight four examples of new frontiers being engaged by medical anthropologists.

A recent "more than human" turn in anthropology has led to multispecies ethnography that focuses on entanglements and a blurring of boundaries between species, microorganisms, and machines in the case of cyborg technology. Medical anthropologists are contributing to this research in many different ways. An example is investigations of (re)emerging zoonotic diseases associated with changing human–animal contact related to factors such as climate change, deforestation, human encroachments on natural habitats, and forced migration. Recent pandemics of zoonotic origin have led to a demand for studies of environments of risk as potential disease outbreak hot spots, local recognition of animal mortality serving as a possible early warning signal, risky behaviors related to zoonotic disease transmission (before, during, and following disease outbreaks), and public response to the techniques used in contemporary veterinary public health to manage animal diseases (Keck 2019). Such studies are vital to both a One Health agenda that acknowledges that the health of humans, animals, and ecosystems are interdependent, and pandemic preparedness programs (Bardosh 2016).

A second frontier ushered in by recent advances in microbiology is the "microbial turn" (Paxson and Helmreich 2014), a post-Pasteurian paradigm shift in how we think about the body, health, disease, and self. Anthropologists have become increasingly aware that the development, growth, and health of all macroorganisms are influenced by the ecology of the microbial communities they host (Benezra et al. 2012; Brives and Zimmer 2021; Raffaetà 2023). Human evolution entails interspecies collaboration.

Seeing humans as assemblages of commensal and symbiotic microorganisms (halobionts) that provide critical metabolic, physiologic, regulatory, and host defense functions challenges the perception of humans as existing independent from the rest of nature, and the

body as a machine. It also challenges dominant germophobic and militaristic approaches to medicine and public health relying on sanitation, disinfectants, and antibiotics as weapons in a never-ending war against pathogens. The collateral damage of overusing these weapons to the beneficial organisms comprising our microbiome is now being questioned and the hygiene hypothesis revisited in light of missing friendly microbes resulting from modern lifestyle changes. There is mounting evidence that factors compromising microbial diversity result in dramatic increases in diseases linked to aberrant immune system activity. And it is increasingly being recognized that a pathogen-centered militaristic and a microbiome-centered ecological approach to health need to be balanced.

Medical anthropologists working in conjunction with their microbiologists and medical colleagues are responding to data on the collateral damage of medication overuse on the microbiome (Blaser et al. 2021). They have long studied pharmaceutical practice including antibiotic use and misuse (Radyowijati and Haak 2003). Their efforts are being redoubled due to rising concern about both antibiotic resistance and microbiome dysbiosis especially in the early years of life. They have also begun to research public perceptions of the microbiome (good bacteria, gut health, etc.) as well as practices and products used by the public as a means to restore or promote ecological health. This includes research on perceptions and use of the dizzying array of probiotics and dietary supplements now being marketed as the panacea for the ills of modern living.

Medical anthropologists have further begun to look at health disparity from the vantage point of the microbiome and what Margaret Lock and colleagues have termed situated biologies (Niewöhner and Lock 2018). This concept was introduced to further clarify their earlier concept of "local biology" in the postgenomic era. Local biology is a core concept in medical anthropology that was introduced as a challenge to the biomedical concept of universal bodies. Local biology is based on the premise that biosocial differentiation occurs as a result of the entanglement of biological and social processes that are contingent on time and place. People living in different local environments have different mindful body experiences spanning both well-being and illness. A situated biology lens takes this further and emphasizes the epigenetics of body–environment entanglements and the way our community of microbes responds to physical, social, and political environments.

Anthropologists have begun to consider how structural inequities result in gut microbiome variation (Amato et al. 2021) due to situated biology influenced by life and work environments, the impact of diet, patterns of exercise and sleep, social stress, and so on. This calls for new ways of understanding embodiment and the political microecology of health. Biocultural medical anthropologists are also contributing to the burgeoning anthropology of aging field (Buch 2015; Howell and Harrod 2023) by looking at healthy aging through the lens of situated biology and the microbiome. This demands consideration of residence patterns, pet ownership, intergenerational contact, medication use, diet, and so much more.

A third and related frontier is increased recognition of cumulative toxicities as a feature of the Anthropocene and the current and anticipated impact of rapidly escalating rates of pollution on the ecology of all species on the planet (Liboiron et al. 2018; Tsing et al. 2019). Pollutants range from those released by agriculture, industry, and construction to war and disaster, our poor disposal of the multitude of synthetic materials we have come to rely upon over the last half century to effluent from the medicines we take and the preservatives we use in foods, and the fuels we use in transportation to those used to heat and cool our built environment. These pollutants have long half-lives and present us with a scenario of uncertainty much in line with the German sociologist Ulrich Beck's concept of Risk Society. We are now faced with bads (side

and after effects) from the goods we produce and have come to take for granted. In addition to having potential toxic properties in their own right, pollutants interact with other chemicals in the environment resulting in levels of toxicity through synergy that supersede those identified by regulatory agencies charged with assessing their harm in isolation.

Medical anthropologists are taking increased interest in all aspects of chemosociality (Kirksey 2020), altered, attenuated, or augmented relationships that emerge with chemical exposures as well as what Alex Nading (2020) has referred to as "toxic worlding" – how we are affected by and affect life in a toxic world. This requires a multilevel analysis of how people, communities, and policymakers perceive and deal with the risk of pollutants. An example is research being conducted on the lifecycle and social life of plastic and plastic pollution, one of the greatest environmental challenges of our age (Pathak and Nichter 2019).

Research on toxic worldings calls for investigations of the impact of a transition to urban living on situated biology and human health given estimates that 70 percent of the global population will live in urban areas by 2050, spending 90 percent of its time in constructed environments. This entails research on chemical and pathogen exposure in the built environment (buildings, infrastructure, and transportation) as well as devices introduced to monitor bodies and spaces (e.g., wastewater surveillance). How will such monitoring affect public perceptions of risk and safety, harm reduction behavior, and lifestyle decisions?

A fourth frontier is the ecology of online information environments and ways in which telecommunication affects perceptions of health and health-care behavior. In the post-truth era, misinformation and disinformation spread by social media through echo chambers and filter bubbles have eroded trust in the sciences including medicine, a phenomenon readily seen during the COVID-19 infodemic. Medical anthropologists face the challenge of studying the production, distribution, and circulation of health-related facts and imaginaries in a nonlinear dynamic ecosystem where experts are not the only source of information influencing public understanding. One of the tasks ahead for anthropologists will be critically assessing how the term misinformation is used and differentiating misunderstanding from alternative worldviews held by different epistemic communities. Future studies of how health information travels and the stickiness of alternative knowledge frames in our fast-paced attention economy will require medical anthropologists to draw upon both linguistic anthropology and science and technology studies.

Medial anthropologists will also need to re-examine practitioner–patient interactions given that a significant percentage of patients now consult the Internet before and after visiting a healthcare provider. How do online searches by the ill and significant others alter dialogue and decisions about health care, and change the works of illness by all parties concerned? To what extent is self-care being guided by Internet searches in a poorly regulated online environment where infomercials masquerade as science to gullible sectors of the population?

Technologies such as mobile phones and smartphones are also changing the conditions and expectations of what Tanja Ahlin (2023) has described as technologically mediated co-present care in a study of migrant nurses. We need to know far more about how telecommunication is changing the communication of distress, care, and concern as well as contributing to feelings of collective welfare and digital kinship in network society.

## CONCLUSION

Medical anthropology has a "big tent" research agenda that draws upon many different theoretical approaches, resists disciplinary imperialism, and is open to transdisciplinary

exploration (Panter-Brick and Eggerman 2018). Under this big tent are medical anthropologists adopting different roles and identities. What they have in common is a commitment to investigate health, resilience, and care, the experience of illness, the (mal)distribution of disease, and healing in nested contexts that span micro to macro environments. As a named subdiscipline, medical anthropology is 50-odd years old and rapidly evolving in response to both old and new challenges in the Anthropocene. The designation "medical" is indexical and subsumes health anthropology broadly conceived.

SEE ALSO: Biopolitics; Disease Ecology; Epigenetics; Ethnography; Gender and the Body; Health Disparities; Illness Experience; Medical and Illness Narratives; Pharmaceuticals and Society

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