



Public health for the hunter-gatherer in us all

Charles Gardner¹ · Donald C. Cole² · Loretta Ryan³

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Abstract

In evolutionary terms, the transformations which humans have engendered in social, ecological and built environments are increasingly out of step with their biological makeup. We briefly review the evidence on health-relevant practices and status of our Paleolithic ancestors and contrast these with current food, transportation, work and governance systems with their associated impacts on human health. As public health and planning practitioners engaged in the EcoHealth Ontario Collaborative, we argue for recognition of our hunter-gatherer nature to promote joint efforts in building sustainable and equitable community infrastructures, both built and green. Although such efforts are underway at multiple jurisdictional levels across Canada, the pace is frustratingly slow for the burden of endemic chronic diseases and global environmental change which humans face. Reminding reluctant stakeholders of the hunter-gatherers in us all could bring about deeper reflection on the urgent work in redirecting community planning.

Résumé

Sur le plan de l'évolution, les transformations que les humains ont apportées aux environnements sociaux, écologiques et bâtis sont de plus en plus en décalage par rapport à leur profil biologique. Nous examinons brièvement les données sur les pratiques et l'état de santé de nos ancêtres du Paléolithique et les comparons aux systèmes actuels d'alimentation, de transport, de travail et de gouvernance, avec leurs effets sur la santé humaine. En tant que praticiens de la santé publique et de la planification participant à la collaboration EcoHealth Ontario, nous plaidons pour la reconnaissance de notre nature de chasseurs-cueilleurs afin de promouvoir des efforts conjoints de construction locale d'infrastructures bâties et d'infrastructures vertes durables et équitables. Bien que de telles initiatives soient en chantier dans plusieurs administrations au Canada, leur rythme est désespérément lent vu le fardeau que représentent les maladies chroniques endémiques et les changements environnementaux mondiaux pour les humains. En rappelant aux acteurs réticents qu'au fond nous sommes tous des chasseurs-cueilleurs, nous pourrions susciter une réflexion approfondie sur l'urgence de réorienter l'aménagement urbain.

Keywords Paleolithic diet · Ecosystem · Exercise · Environment design · Urban planning · Environment and public health

Mots-clés Régime paléolithique · écosystème · exercice physique · conception de l'environnement · urbanisme · environnement et santé publique

✉ Charles Gardner
Charles.Gardner@smdhu.org

¹ Simcoe Muskoka District Health Unit, 15 Sperling Drive, Barrie, Ontario L4M 6K9, Canada

² Dalla Lana School of Public Health, University of Toronto, Health Sciences Building, 155 College Street, Toronto, Ontario M5T 3M7, Canada

³ Association of Local Public Health Agencies (alPHA), 480 University Avenue, Suite 300, Toronto, ON M5G 1V2, Canada

For most of their 250,000 years, humans were hunter-gatherers, living off of what nature provided and they could procure (Richards 2002; Diamond 2013; Lieberman 2014) (see time periods, Box 1). As a consequence, the fossil record shows that our Paleolithic forbears rarely had cavities (Lieberman 2014) as their diets were largely devoid of simple sugars and starches (Richards 2002). Studying the way of life of current Indigenous hunter-gatherers is instructive (Walker 2001; Richards 2002; Lieberman 2014). Although child mortality for them is high (due to accidental injury and predation), the modal age of death among the adults is actually quite elderly—about 72 years (range 68–78 years) (Gurven and

Kaplan 2007). They remain robust and productive until late into their lives, with chronic diseases being uncommon (Walker 2001; Gurven and Kaplan 2007; Lieberman 2014; Diamond 2013). In this commentary, we argue that more clearly recognizing our hunter-gatherer origins, ways of life and needs can inform ongoing debates about development pathways, sustainability and health.

Box 1 Humans' prehistory Stone Age periods with approximate, estimated dates

Paleolithic (or Old Stone Age)—2.5 million years ago to 10,000 BC. Hunter-gatherers
Mesolithic (or Middle Stone Age)—10,000 to 8000 BC. Settling & cultivation
Neolithic (or New Stone Age)—8000 to 5000 BC. Agricultural food production

Variability across locations globally. Sources: <https://www.history.com/news/prehistoric-ages-timeline>, <https://www.inrap.fr/en/periods>

Origins of humans' biology systems mismatch and impacts on determinants of health

Since the end of the last ice age some 12,000 years ago, a new agrarian way of life compromised the diversity and the sufficiency of human diets, while the large increase in food volumes stoked a dramatic surge in population size. In a cycle of recruitment, conquest and displacement, the ever larger, hierarchically organized agrarian populations supplanted the more egalitarian hunter-gatherer way of life (Lieberman 2014; Diamond 2013; Richards 2002). Analysis of the historic record demonstrates profound wealth and power disparity in all mass societies with the arrival of agriculture and material surpluses (Scheidel 2017). Increased proximity to domesticated animals led to zoonotic diseases, such as tuberculosis and the devastating smallpox (Lieberman 2014; Diamond 2013; Walker 2001; Richards 2002), similar to current viral pandemics. The fossil record shows that, compared with their Paleolithic forbears, Neolithic peoples were shorter in stature, with skeletal findings consistent with poorer nutrition and an increased prevalence of infectious diseases (Lieberman 2014; Richards 2002).

With the industrial revolution late in the eighteenth century came permanent, massive migration of rural populations into swelling cities. With concomitant resource extraction through colonialism and transformations in agricultural production globally, dramatic increase in overall macronutrients enabled a sufficient boost of material well-being for most in imperialist countries to regain the physical stature of the Paleolithic era (Lieberman 2014). Public health sanitation with municipal infrastructure investments (OPPI 2016) allowed most high-income country populations to regain a relative freedom from

communicable diseases of the Neolithic era (Tam 2017). Yet years of life expectancy were lost as a result of the ultra-processed diet and its correlate obesity (Nardocci et al. 2019), along with other industrial products such as tobacco and alcohol (Lieberman 2014). The mass marketing of the automobile in North America resulted in community urban design that demands its use to obtain the basics of human existence, whether acquiring food, or access to work, education or recreation (BCCDC 2018; OPPI 2016; Tam 2017). Impacts include road and pedestrian trauma, poor air quality and associated chronic diseases, and a massive carbon footprint (CPHA 2015; OPPI 2016). Populations in high-income countries now suffer from chronic diseases that are rarely seen even in the elderly years among hunter-gatherers (Gurven and Kaplan 2007). Both the agrarian and the urban ways of life have conflicted with our hunter-gatherer genetics and needs (Walker 2001; Richards 2002; Lieberman 2014).

Understanding ourselves biologically as hunter-gatherers—what do humans need?

We recognize that humans cannot go back to being hunter-gatherers *en masse*. Our numbers are too vast—at least 1000 times more numerous than the planet's carrying capacity for such a way of life (Diamond 2013). Furthermore, the way of life of hunter-gatherers was and is as varied as the many environments in which they have lived: tundra, open plains, deserts, seashores, tropical rainforests and more, such that no single "Paleodiet" existed (Walker 2001). Nevertheless, some common features of their ways of life have emerged (summarized in column 1, Table 1) (Walker 2001; Gurven and Kaplan 2007; Diamond 2013; Lieberman 2014).

As hunter-gatherers, we ate fresh, unprocessed foods which were generally accessible; we can approach this by going back to supporting farmers' markets and personal food production within residential neighbourhoods (CPHA 2015; Tam 2017; BCCDC 2018; OPPI 2016). As hunter-gatherers, we had moderate intensity physical activity most days. We can rebuild safe physical activity into our communities, and also dramatically reduce our carbon footprint through community design that emphasizes walking and cycling, as well as recreational public spaces and facilities (CPHA 2015; OPPI 2016; Tam 2017; BCCDC 2018). As hunter-gatherers, we daily experienced green spaces, wild or partly managed, on a daily basis, as many rural people still do. Relationships with other species were essential to hunter-gatherers, who kept moving so as not to compromise the ecosystem that sustained life and "all our relations" (McGregor 2010). Compact, green communities with attention to biodiversity could move us again in this direction (CPHA 2015; OPPI 2016). Hunter-gatherers spent much of their time with family and friends even when migrating (Gamble 1999). Supportive labour and employment

Table 1 Hunter-gatherer livelihood characteristics and respective partner roles for change towards them

Hunter-gatherer characteristic	Partner roles for change	
	Municipal planning	Public health
Diverse diet, largely devoid of simple sugars and carbohydrates, and low in salt	Create community and personal food gardening, grocery stores in every neighbourhood, and farmers' markets	Promote healthy food environments, restricting the availability of highly processed, high salt and sugar foods/drinks
Moderate to intense levels of physical activity structured into their daily lives	Design and modify/build infrastructure for active transportation	Activity promotion campaigns, provision of evidence on the health benefits of active transportation
Most time outdoors with daily exposure to the natural environment, in a sustainable, evolving ecosystem	Protect green space—infrastructure, fund tree planting, and work with ecosystem partners	Encourage outdoor activities (with sun protection) in collaboration with parks organizations and other ecosystem partners; provision of evidence on the health benefits of “green time”
Live in close proximity to extended family and neighbours, providing communal support, including for each other's children and the elderly	Design and modify/build community social spaces, and more complete communities that provide workplaces close to our homes	Participation in community planning for age- and youth-friendly communities; provision of evidence on the lifelong health benefits from optimal childhood nurturing
Egalitarian material resource distribution and group decision-making	Equity, diversity and inclusion policies and participatory governance. Mixed housing community design, and public transit systems meeting the needs of all levels of income	Advocacy for equity, diversity and inclusion policies addressing social and ecological determinants of health; provision of evidence on health equity, and the social determinants of health

Sources drawn upon: Column 1 (Walker 2001; Gurven and Kaplan 2007; Diamond 2013; Lieberman 2014) and columns 2 and 3 (EcoHealth Ontario 2017; Tam 2017; BCCDC 2018)

policies, working at home as in this COVID-19 pandemic, and providing workplaces close to homes, reducing commuting distances and travel time, could better foster such relationships (CPHA 2015; Tam 2017; OPPI 2016; BCCDC 2018). As hunter-gatherers, we had a more equitable distribution of material wealth and decision-making power, so now need stronger commitments to political processes that enable these (Janzen et al. 2018).

Public health and municipal planning together

Through the EcoHealth Ontario Collaborative, we have worked together to promote sustainable and equitable community infrastructures, both built and green, which can meet the needs of humans who still carry the genes of hunter-gatherers (see columns 2 and 3, Table 1). Urban planning that curbs the car culture and provides a full range of services and retail, including healthy fresh produce, social spaces and green spaces within walking distance of people's residence, along with well-developed active transportation and public transit systems is essential to the avoidance of chronic diseases (as well as injuries) and the promotion of mental health, healthy child development and quality of life (OPPI 2016; Tam 2017; BCCDC 2018). Official community plans have been reviewed for active living-related components and the impact of municipal transportation master plans on chronic disease incidence

has been estimated (Arnason et al. 2019). Both public health and planning communities (private and not-for-profit, as well as municipal) have supported community planners, fostering improved health through walkable, cycleable, complete and compact community design (Tam 2017) and incorporating green space into community planning and investments (EcoHealth Ontario 2017).

Persuading others to modify development models

Yet the results of these efforts are frustratingly slow in an era of endemic chronic diseases (Tam 2017), global pandemics and global environmental change (CPHA 2015). With a dominant extractivist orientation, human societies continue to enact the sixth major extinction in our planet's history, prompting calls for the present era to be renamed the Anthropocene (i.e., *the era of humans*) (Hancock 2015). In response, public health thought has expanded to include the importance of ecology with multiple related terms being used (Buse et al. 2018), including *ecohealth*, *one health* and *the ecological determinants of health* (CPHA 2015), as well as led proposals for more fundamental eco-social transformation (Parkes et al. 2020). We would argue that recognizing the hunter-gatherers in us all is an important, additional conceptual tool to prompt deeper reflection on the urgent work needed in redirecting development of human societies and places.

Understanding our Paleolithic *Homo sapiens*—hunter-gatherer selves—with our great longing for the forest and the ancestral village, can clarify a common vision of changes needed, and better motivate less enthusiastic stakeholders to alter destructive development pathways and promote both health and longer-term survival of humans and the ecosystems of which they are part.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflicts of interest.

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