



# Planetary health action framework: A case study

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Grassroots

Enrique Falceto de Barros<sup>1</sup>, Tatiana Souza de Camargo<sup>1</sup>, Airton Tetelbom Stein<sup>2</sup>, Alan Abelsohn<sup>3</sup>, Diogo Onofre de Souza<sup>1</sup>

<sup>1</sup>Instituto de Ciências Básicas da Saúde, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil; <sup>2</sup>Public Health Department, Universidade Federal Ciências da Saúde de Porto Alegre, Porto Alegre, Brazil; <sup>3</sup>Clinical Public Health Division, University of Toronto, Toronto, Canada

**Corresponding author:** E. F. de Barros (enriquefbarros@gmail.com)

## ABSTRACT

Planetary Health (PH) action is urgent to avoid the collapse of Earth's systems that sustain human health. PH care has been proposed as an approach to improve health equity and reduce healthcare's ecological footprint. This paper presents the conceptual framework of patient-centered PH care as essential for PH action at the community level. We examine and reflect on one primary care clinical case through 8 lenses: 1) Actor-Network Theory, 2) Evidence-based medicine, 3) Patient-Centered Clinical Method; 4) Principles of Primary Care, 5) Proposed new primary care derivate principle of PH care, 6) the WONCA's (World Organization of Family Doctors) core competencies tree, 7) WONCA's curriculum, and 8) Sustainable Development Goal 3. This case offers insights into functions of primary care that mitigate, adapt and build resilience to the challenges of climate emergency and Anthropocene. It "connects-the-dots" to propose a new identity of primary care, elaborate a blueprint for patient-centered PH care and a roadmap for PH action at the community level.

## KEYWORDS

Climate Change, Patient Centered Clinical Method, Planetary Health, Primary Care

## INTRODUCTION

Planetary Health (PH) action is urgent to avoid the collapse of Earth's systems that sustain human health and our civilizations. The Anthropocene (Whitmee, et al 2015), the epoch of humanity's marvelous achievements in arts, sciences, life expectancy, among others, is also the age of the acceleration of population and disruption of planetary systems, driven by unrestrained, hyper consumerist economic and epistemic systems. Thus, resulting in climate change, ocean acidification, widespread pollution including biogeochemical flows, pesticides, air pollution, and microplastics, 6th mass species extinction, emerging zoonotic diseases, widespread antibiotic resistance, and stratospheric Ozone depletion. We are operating on the brink of catastrophe, which could reverse decades of improvement in child health, life expectancy and

poverty eradication (Whitmee, et al 2015). However, there is much room for optimism if our civilizations' collective wisdom from western, eastern, origin and indigenous peoples join in collective PH action.

Humankind needs to urgently invest in solutions based on imagination, knowledge, and implementation of strategies that improve health equity, protect and regenerate natural ecosystems that sustain our human civilizations (Whitmee, et al 2015). Many macro-strategies can potentially improve health at the macro-population level with co-benefits for the planet, such as moving away from fossil fuels. PH care has been proposed as a solution to improve health equity, a core goal of PH actions, while reducing healthcare system's ecological footprint. One acclaimed roadmap for health equity is high quality primary care, which should be the basis



for Universal Health Coverage within directives of the 3rd Sustainable Development Goal (SDG3) (United Nations, 2022). This mission is enough to inscribe primary care in the blueprint of the PH vision. Beyond a pillar for SDG3, primary care intrinsically plays unique roles in mitigation, adaptation, and resilience to the climate emergency and Anthropocene challenges (Haines & Floss, 2021) - which deserve our careful attention. A closer look may give new insights for patient-planet win-win strategies and smarter innovation for PH action.

A vanguard vision of Planetary Health Care was compared to a renewed Alma-Ata 2.0 (Guinto, 2018). Alma-Ata was a landmark global health policy document that reinforced health as a fundamental human right and prescribed primary care as a vital strategy toward achieving 'Health for All.' PH Care has also been articulated as a framework for sustainable health systems, with important tasks for primary care (MacNeill, 2021). Moreover, PH Care has been proposed as a new derivative principle of primary care (Barros et al, 2022). These complementary visions look at primary care from a macro-scale, supra-national level, and top-down approach of how to secure the progress of human health equity with environmentally friendly healthcare systems. They highlight the need for primary care to have PH action at the community level. Therefore, we need the supportive perspective of primary care practitioners from bottom-up, from the micro to the macroscale and from the patient to the planet, to identify gaps, weaknesses, challenges, and opportunities of these convergent frameworks.

Primary care providers have been summoned to PH action (Iacobucci, 2019). These clinicians have pragmatic opportunities for patient-planetary health co-benefits (Redvers, 2021) for mitigation, adaptation, and resilience to climate change and other Anthropocene challenges. Some of these examples of mitigation are lifestyle recommendations towards active transportation (fewer cars and more walking/biking), a planetary health diet (less red meat and more plant-based), reduced overdiagnosis and overtreatment, and reduction of deforestation (Jones, 2020). Examples of adaptation include advising patients how to prepare the indoor environment for climate extremes and build primary

care infrastructure to underprivileged communities. Examples of resilience are advising patients to avoid diuretic drug induced dehydration during heat waves and treating the more frequent waves of new pandemics (such as cases of flu, COVID, and antibiotic resistance) (Xie et al, 2018). These characteristics, along its celebrated capacity to maximize health while minimizing environmental damage, explain why it has been called the "green medicine" (WONCA Europe, 2020).

In this conceptual paper, we examine a primary care clinical case which illustrates how a clinical encounter has intrinsic patient-planetary health co-benefits on mitigation, adaptation, and resilience to challenges of the Anthropocene. We examined this case through eight lenses to conceptualize a blueprint for patient-centered PH care and bring forth a new identity for primary care. These 8 lenses help make the case for this paper's central argument: primary care is intrinsically patient-centered PH care and is essential for PH action at the community level. In the same spirit of Starfield's description of the primary care principles, patient-centered PH care is a characteristic of high-quality primary care, and need not be seen as a new recommendation, but rather as an underlying function of primary care providers.

The merit of Starfield's framework was to depict a blueprint for higher-quality primary care and a roadmap for investments to improve healthcare outcomes. It clearly defined an identity and expanded the recognition of primary care providers to the frontstage of healthcare systems. In this same spirit, this patient-centered PH care framework is not to change what primary care providers do, nor is it supposed to be the "last straw on the back" of overburdened clinicians. This framework is more about "connecting-the-dots" of current primary care practice, to reveal the patient-centered PH care blueprint, and to offer a road map for urgent investments for better healthcare outcomes. This concept helps elucidate the current role of primary care providers and may stimulate the inclusion of a One Minute for the Planet (OMfP) in the clinical encounter as shown in the case report.

### CONCEPTUAL FRAMEWORK



The purpose of this conceptual discussion is to present the conceptual framework of patient-centered PH care as essential for PH action at the community level.

This conceptual discussion is based on reflections of the experience of primary care clinical practice. It is a reflective analysis of a clinical case report. It describes and analyzes a clinical case of patient-centered PH care. This investigation will use 8 lenses from primary care's philosophy, methods, techniques, and education. These 8 lenses will examine the why, what, and how the patient-centered PH care concept is applied from the patient scale to the PH scale.

The 8 lenses are:

### 1. Actor-Network Theory

Tool to study a phenomenon by following the actors (both human and non-human); that is, by observing and describing how they act when associating in networks (Latour, 2007).

### 2. Evidence-Based Medicine

Integration between the realms of patient values, individual clinical expertise, and best external evidence (Akobeng, 2005).

### 3. Patient-Centered Clinical Method

Four-component conceptual framework: a) exploring health, disease, and the illness experience; b) understanding the whole person; c) finding common ground, and d) enhancing the patient-clinician relationship (Ryan, 2019).

### 4. Four Core Principles of Primary Care

a) First contact/access, b) person-focused continuity of care, c) comprehensiveness, and d) coordination. Other three derivate principles are: family orientation, cultural competency and community orientation (Barros, 2021; Starfield, 2012).

### 5. Primary Care Derivate Principle

Acknowledgment of the interconnections between human and non-humans (living and nonliving) within nature, and therefore, the interdependency between patient care from community to planetary level and vice-versa (Barros, 2021).

### 6. WONCA (Figure 1)

Essential characteristics and competencies of the discipline (Hummers-Pradier et al, 2009).

### 7. WONCA Three Dimension curriculum (Figure 2)

a) Knowing essential concepts and tools; b) Comprehending the 4 core principles of primary care; and c) Applying skills appropriate to the general practice consultation (Simmenroth et al, 2020).

### 8. The Sustainable Development Goal (United Nations, 2022)

Ethics approval was not acquired, as this is a fictitious case report carefully based on the authors' clinical experience.

## REFLECTIVE ANALYSIS

This clinical encounter happened in the summer of 2022, in São Martinho, a rural town (around 8,000 inhabitants) in southern Brazil.

Ana, 23 years old, brought her 4-year-old daughter Bárbara, with a rash and fever, to see her family doctor Fernando. Bárbara was diagnosed with Dengue Fever based on the clinical-epidemiological presentation. After a quick point-of-care Uptodate review (an evidence-based medicine tool), Fernando prescribed hydration, acetaminophen as needed, and avoidance of non-steroid anti-inflammatories to Bárbara. Fernando reassured Ana that Barbara would be OK; and agreed they would return for an in-person examination or a WhatsApp (smartphone messaging APP) check-up if Barbara felt better.

In the same encounter, Ana complained of shortness of breath associated with wheezing since the family had COVID-19 three months before. Fernando diagnosed Asthma aggravated by Long



Covid. Ana was prescribed evidence-based treatment with Formoterol Budesonide dry powder inhaler (DPI) as needed. Ana was counseled about how to use the medication, to avoid triggers such as air pollution (the community uses wood stoves) and was given a medical certificate to avoid chemical exposure (she works in a shoe sweat-shop factory). Fernando and Ana discussed whether it would be necessary to order Chest-X ray, blood tests, and spirometry, and both agreed it would not be needed at the present time. Ana was instructed to return if she did not get better.

Ana seemed satisfied with the shared-decision making and was ready to go home. However, Fernando, inspired by the WONCA call for planetary health action, felt compelled to offer One Minute for the Planet (OMfP) to Ana. In this new period of the clinical encounter, Fernando explained that Dengue in Barbara was caused by the vector mosquito that “likes” climate change (excessive rain and warming) and trash (plastics that retain water for mosquito’s procreation). Fernando explained that our future health, and especially Barbara’s, could be improved by avoiding fossil fuels and reducing the burning of forests. Fernando asked whether Ana could consider biking or walking to her job, as that is associated with a significant reduction in non-communicable diseases, but she said she needed to drive her daughter to kindergarten. Fernando also discussed how the reduction of excessive industrialized and red meat consumption would likely help prevent future cardiovascular and cancer diseases, while also reducing the pressure of cattle on Amazon deforestation. The catchphrase was addressed in a culturally sensitive manner confirming that “we need to protect our forests from burning and polluting, as you know our planet is on fire”, followed by “it’s good for you and the planet”. Ana said she was reducing red meat already (probably because Brazilians recently lost much purchase power for red meat). Nonetheless, Ana’s nonverbal expression seemed to convey she was impressed by her doctor’s remarks.

## DISCUSSION

### *First Lens: Actor-Network Theory*

The COVID-19 pandemic has exposed the insufficiency of the “almighty science” and its “magic

bullet” narrative to the public. It exemplifies the shortcomings of science; that is, the process of science is mostly reductionist, full of controversies, stakeholders have different legitimate scientific perspectives, and science alone cannot solve the problems because solutions need to be implemented according to people's values and expectations. In summary, the COVID-19 Pandemic is highly complex, dynamic, and interdependent. This general perception opens room for innovative tools to tackle systems change towards more health equity. In a similar way, the challenge that PH presents needs systemic thinking and complex tools to deal with the problems ahead.

*“In opposition to reduction, complexity requires that one tries to comprehend the relations between the whole and the parts. The knowledge of the parts is not enough, the knowledge of the whole as a whole is not enough ... Thus, the principle of reduction is substituted by a principle that conceives the relation of whole-part mutual implication. The principle of disjunction, of separation (between objects, between disciplines, between notions, between subject and object of knowledge), should be substituted by a principle that maintains the distinction, but that tries to establish the relation”* (Faerron, 2022).

Many healthcare providers may not even perceive any interdependencies between Bárbara & Ana and PH. This is no surprise as the mainstream biomedical model stimulates excessive fragmentation to the point of losing sight of the whole patient among the excessive exams and reductionism to a part of the body (Greene & Loscalzo 2017). Part of the challenge of complex problems is that you may not even recognize that there is a problem in the first place. A Brazilian anecdote teaches that “unless you know what you are looking for, you will not find it when you see it.” Hence, primary care providers need a framework to start visualizing the complex problem.

Actor-Network Theory has been used as an educational tool to highlight the complexity of clinical cases under a PH perspective and allows us to connect-the-dots. This method stimulates observers to fit the part within the whole and the whole within the parts. Technically, Actor-Network Theory is an



epistemological tool to look for human and non-human actors interacting to form a network of interdependencies that goes beyond the simplified mechanistic cause and effect biomedical model, to understand and intervene in disease. Although intuitive to many, the why, what and how's of patient-centered PH care may not be easily described in scientific terms. Actor-Network Theory helps to clarify and find common language between healthcare providers (Barros & Camargo, 2022).

[Figure 3](#) is a visual representation of patient centered PH care as imagined by Fernando's as a heuristic picture and starting point for patient-centered PH care. The balloons symbolize key elements in the network, but sizes do not reflect relevance. Colors indicate somewhat independent nodes. The lines represent interdependencies, not necessarily causal. The entanglement of balloons and lines is intended to highlight the dynamic complexity of this system but does not represent all interdependencies.

### **Second Lens: Evidence-Based Medicine**

Stronger evidence-based medicine leads to better healthcare outcomes, reduced overdiagnosis and overtreatment. Hence, evidence-based medicine has lower ecological externalities and offers better cost-benefit. All primary care providers who strive to follow evidence-based medicine already provide an intrinsic and passive positive effect on planetary health, as most of the carbon footprint of general practitioners comes from prescribing (Bansal & Blashki, 2020).

In our case study, Fernando appropriately diagnosed Dengue and Long COVID exacerbated asthma, used a point-of-care evidence-based medicine tool to confirm the best diagnostic and treatment strategy, and adapted it to Ana & Bárbara's context.

The prescription of Formoterol Budesonide dry powder inhaler, instead of an albuterol metered dose inhaler, is an example of an evidence-based recommendation which improves health and avoids greenhouse gas propellants, substantially reducing GHG emissions (Bansal & Blashki, 2020). The trustful

relationship between Ana and Fernando enabled evidence-based medicine to protect from overuse, and avoid antibiotic prescription, or emergency-room visits.

Evidence-based medicine, in synergy with PH sciences, should be a cornerstone for the evolving field of "patient-planetary health co-benefits prescribing" (Redvers, 2021). In our case study, we see two forms of patient-planetary health co-benefits prescribing. In the first period of the clinical encounter, the practice of evidence-based medicine had a secondary practical value of optimizing resources and reducing environmental externalities. Evidence-based medicine is still an underused framework to check and balance medical-industrial complex overuse.

*"[...] in both low-income and high-income nations, ineffective, scientifically unwarranted care seems to account for close to about one-quarter to one-third of total volume for many procedures" (Berwick, 2017)*

Overuse of procedures and drugs generates more unnecessary and harmful healthcare interventions, hyper consumerism, overexploitation of resources, and pollution of soil, water, and air; on the other hand, it drains resources that should be invested into underused healthcare services. The evidence-based medicine approach is the authoritative lens that reveals that fragmented healthcare models and a hospitalo-centric approach, such as in the US healthcare system may have higher rates of iatrogenic deaths, while also being more energy intensive (Makary & Daniel, 2016; Solomon & LaRocque, 2019). Fernando felt safe helping Bárbara avoid an emergency visit, as evidence shows mild-moderate Dengue can be handled at the community level.

Evidence-based medicine is the cornerstone to determining which patient may get better treatment in primary care or at the hospital. It has been stated that "Any patient who is treated in an expensive, carbon-intensive hospital when they could be equally well managed in the community or at home is failing the patient, the system, and the planet" (Pencheon & Wight, 2020). A 5% increase in funds for primary care across low-income and middle-income countries



could save up to 60 million lives by 2030 (Haines & Floss, 2021). If we are to improve health equity worldwide and reduce the healthcare ecological footprint, evidence-based primary care is essential.

A typical clinical encounter would end with treatment and follow-up recommendations. However, following calls to act on planetary health, Fernando proceeded to a second part of the encounter to explore OMfP with Ana. Fernando educated Ana about the environmental and social determinants of health and encouraged her to consider active transport and reducing red meat as a means of collaborating to reduce the ecological footprint. (Xie et al, 2018)

In this second period of the encounter, OMfP implements “patient-planetary health co-benefits prescribing”, where the clinician exerted explicit planetary and climate activism, while not directly linked to the primary objective of the consultation (Bárbara’s illness). In this case Dengue was a proxy for activism. The OMfP has to be used with moderation, under a patient-centered PH care framework. There is a fine line between recommending OMfP and proselytism. This could be an interesting field of research, to answer such questions as how and when to apply it, investigate whether it is effective in changing beliefs and attitudes, and whether it is cost-effective. Evidence-based medicine and clinical guidelines should consider explicitly incorporating PH care and could incorporate OMfP. Herrmann and colleagues (2022) reasoned:

*“All medical associations and organizations who publish medical guidelines should include a strategy that systematically addresses planetary health issues in their guidelines. Straightforward reporting of environmental impacts (e.g., greenhouse gas emissions) of diagnostic and therapeutic procedures and reporting on lifecycle assessments of medical products; particularly provide guidance if environmental impacts differ between clinically equally effective procedures”*

If such recommendations are followed, patient-planetary health co-benefits prescriptions would become more scientifically robust and more widely

disseminated, and OMfP would be more appropriately and widely practiced.

### ***Third Lens: Patient-Centered Clinical Method***

MacNeil and colleagues state that “Patient-centered care is central to transforming the culture of healthcare towards resource stewardship, and fewer environmental externalities, to prioritize health and wellbeing above diagnosis (the desire to know) and cure (the absence of disease)” (MacNeill et al, 2021). The Patient-Centered Clinical Method is a technique to explore objective and subjective aspects of the patient-clinician encounter and of the presenting problem, to know the context of the patient, and to build a common place for mutual understanding of the problem.

The patient-centered clinical method has been shown to improve health outcomes (Ryan et al, 2019) Of note, the patient-centered clinical method has been promoted as a bioethical tool to promote patient autonomy. However, as the term patient may imply passivity, many have used person-centered care instead. In Portuguese the Patient-Centered Clinical Method was translated into Person-Centered Clinical Method (Método Clínico Centrado na Pessoa), to imply and reinforce the autonomy of the person in the consultation. For the sake of clarity and to facilitate language concordance with the evidence-based medicine method, the Patient-Centered Clinical Method, and the term patient-planetary health co-benefits prescription, the authors adopt the term patient throughout the text.

The Patient-Centered Clinical Method is crucial to the evidence-based medicine dimension of patient values & expectations, by finding common ground for best-tailored treatments, to avoid unnecessary investigations, overdiagnosis, and overtreatment. This is the intrinsic and passive positive value of combined evidence-based medicine and Patient-Centered Clinical Method for patient-planetary health co-benefits. This method was effective with Ana due to good primary care principles - especially continuity of care. As Professor Martin Marshall, chair of the Royal College of General Practitioners said:

*“If relationships were a drug,*



*guideline developers would mandate their use.”  
(Morland, 2022)*

Continuity of care, and a good rapport, were key to making sure that neither Fernando nor Ana felt OMfP as proselytism, but as caring. This subjective feeling is a gray line between caring and indoctrination. Despite calls to action for health-professional involvement in mitigation efforts, there is evidence demonstrating that clinicians may not feel comfortable advising clients about climate change impacts and health (64% percent of primary care physicians in one US state believe climate change was affecting their patients' health, whereas only 17% were comfortable counseling patients about climate change and health) (Redvers, 2021).

In the future, as planetary health challenges become increasingly disturbing to individuals, there may be a shift in perception of interdependencies between human and planetary health. This is a trend that may be contributing to the increasing eco-anxiety. If this trend continues, the Patient-Centered Clinical Method may need to explore the individual perceptions about the dichotomy between the individual and planet, and to optimize patient-planetary health co-benefits prescription and OMfP with a special focus in mental health.

#### **Fourth Lens: Primary Care Core and Derivate Principles**

Barbara Starfield described four attributes, or principles of primary care: 1) first contact/access, 2) continuity of care, 3) comprehensiveness, and 4) coordination. Later she described other three derivate attributes: 5) family orientation, 6) cultural competency and 7) community orientation ([Figure 4](#)) (Barros et al, 2021).

Primary care principles were essential for Ana & Bárbara's community to withstand the devastating waves of COVID-19. Hospitals were overwhelmed and people were treated with oxygen concentrators in their homes, managed by primary care providers. Fernando explicitly advised the mayor and the health secretary to buy this life saving oxygen concentrators before the first wave of COVID. Deaths would be higher without the resilience of the community's

primary care. The epidemic of Dengue was also softened by the resilience of the primary care services in their town. Fernando worked in a Dengue epidemic in Rio de Janeiro in 2008 where a fragmented and hospital centric system collapsed with 55 deaths, while the neighboring Niteroi city had no deaths, due to its advanced primary care services adaptation (primary care teams blocking mosquito propagation) and resilience (early treatment in the community)s) Despite a gap of high quality evidence, it is likely that communities served by high quality primary care will be better adapted and have more resilience to emerging zoonotic diseases, climate-extremes, and other environmental health hazards. Hummers-Pradier and colleagues (2009) highlight that:

“The strength of a country's primary care system is inversely associated with all-cause mortality, all-cause premature mortality and cause-specific premature mortality from asthma and bronchitis, emphysema and pneumonia, cardiovascular disease and heart disease. Strong primary care systems and practice characteristics, such as geographic regulation, continuity of care over time, coordination and community orientation are correlated with improved population health, and primary care (in contrast to specialist care) is associated with a more equitable distribution of health in populations. A gatekeeper role of the GP is seen to be an important cost-control measure and prevents harm due to unnecessary hospitalization and over-investigation”

Ana and her family's primary care services have good core and derivate principles. Good access and comprehensive services open the doors for encounters, care situations, and opportunities for a trustful patient-doctor relationship that has positive feedback with continuity of care. Good coordination ensures coherent and satisfactory use of resources within primary care, guarantees more prudent access to specialists, certificates for occupational health related problems and legal conditions, social prescribing, avoids ineffective care, and allows for nudging OMfP.

The core principles of primary care worked well for Ana and her family. Of note, access was facilitated to Ana by offering a virtual follow up appointment, which has been praised as environment friendly. This



trustful context leads to the derivative principle of family orientation and helps to incorporate her culture and community, which are always in the background of the consultation, making common ground not only an abstraction. With continuity of care, every principle of primary care interdependently and positively feeds back on each other, making the patient-centered clinical method flow smoothly. Again, knowing the patient's context is decisive (Greene & Loscalzo, 2017) because in primary care many times the "postal-code is more important than the genetic-code".

These good primary care principles and the patient-centered clinical method help explain how Fernando and Ana reached a satisfactory rapport. The center of the consultation moved from a stagnant "disease" - from the doctor's biomedical and disease perspective - into Ana's notion of "illness", and dynamically involving her family, culture, and community in the consultation. Fernando felt satisfied with this holistic patient-doctor encounter. Within this context, Fernando felt it was appropriate to use OMfP. This encounter illustrates a patient-centered PH care framework, (4) where primary care actively promoted climate change mitigation.

#### ***Fifth Lens: The Proposed Primary Care Derivate Principle of Planetary Health care***

Primary care approaches ill health by caring and intervening not only for patients but also for their families, communities, and societies. Today in the era of PH, this commitment must be extended to include the care for the proximal and distal ecological systems that sustain humanity's health. The declaration made by the World Organization of Family Doctors (WONCA) called for action on PH (Iacobucci, 2019). To encompass this new role, it is time to consider adding an eighth attribute to Starfield's primary care framework: Planetary Health care (Figure 4). PH care is underpinned by key PH dimensions such as interconnection within nature, equity and social justice, systems and complexity thinking, acknowledgment of the state of health in the Anthropocene, and movement building and systems change.

Ana & Barbara's health was affected by COVID-19 and Dengue, which are direct impacts of planetary ill health. Their family and community have been hard hit by COVID-19, as it caused widespread deaths, Long Covid, disrupted health care services, massive unemployment, and hunger in Brazil. This context has implications to all dimensions of primary care principles. As exposed above, primary health care was essential for their communities' resilience.

Another anthropogenic challenge to Ana's community, that has had little attention from the PH academic and social movement, is stratospheric Ozone depletion by CFCs. It is worse over the south pole and reaches Ana's community. The resultant increase in UV radiation absorption, has increased melanoma deaths among Ana's neighbors, majorly white-skinned family farmers in the past decade. Fernando has personally treated hundreds of non-melanoma skin cancers and excised more than a dozen melanoma lesions.

The primary care response in Ana & Bárbara's community to COVID-19, Dengue, and the stratospheric Ozone Depletion exemplifies improved community resilience by primary care providers. WONCA president Dr Li said, about the COVID-19 response, that family doctors are "the first in, the last out". Primary care clinicians are already face-to-face with planetary health challenges, and to embrace the framework principle of Planetary Health care will make it easier to define the problems, and coordinate and optimize responses.

Another aspect of PH care is ensuring that healthcare does not contribute to the planetary crisis through its own ecological footprint. It is estimated that the combined healthcare systems of all countries generate 4.4% of the world's total greenhouse gasses. If the healthcare system was a country, it would be the fifth largest emitting nation. Beyond carbon emissions, the healthcare sector also contributes to other forms of environmental pollution. High quality primary care maximizes health equity while practicing the principle of 'do no harm' not just to patients but also to the planet. Hence, primary care must be recognized and strengthened worldwide as a cornerstone of climate and planetary-smart healthcare.



PH care also intensifies primary care advocacy around disease prevention and health promotion. This strategy will not only contribute to the achievement of Sustainable Development Goal 3 but will also reduce the demand for health services and eventually reduce healthcare emissions. Routine evidence-based medicine and patient-centered clinical method inside the clinic optimize prevention and treatment, while intrinsically generating patient-planetary health co-benefits.

“A sustainable healthcare system should match the type and intensity of care provided to the problem. This includes adequately funding primary, community, and long-term care. Insufficient primary care services for so-called ambulatory care sensitive conditions (eg, diabetes, hypertension, chronic obstructive pulmonary disease) result in avoidable hospital-based treatment and comprise 12% of emergency department visits in the USA, 15% in England, and 25% in Canada. Appropriate end-of-life care should involve discussions around prioritization of comfort and quality of life, and avoidance of futile treatments.” (MacNeill et al, 2021)

PH care stimulates clinicians to interrogate the unproductive epistemic dichotomy between patient-planet, and the unreasonable economic models that drive PH damage, to foster alternative blueprints for healthier patients and planet. One overlooked and powerful advocacy action, which can induce a healthier economy, is to push for implementation of the World Health Organization's green procurement for healthcare systems. In the same vein that primary care is founded on the right to health, PH care must be underpinned by a social movement guided by the principles of human rights and equity, recognizing that health is inextricably linked to the enjoyment of the right to a healthy environment. Practitioners must be at the forefront of whole-of-society activism for PH care.

### **Sixth Filter: WONCA Tree**

The WONCA tree of core competencies and characteristics ([Figure 1](#)) (Hummers-Pradier et al, 2009) is intended to be self-explanatory, and its depth goes beyond the scope of this paper. Of note, it is highly correlated with evidence-based medicine,

patient-centered care, and primary care principles. Not surprisingly, Ana and Barbara's case highlights many, if not all, of the WONCA tree of core competencies and characteristics. Again, evidence-based medicine, patient-centered care, primary care principles, and core competencies are all interdependent and have positive feedback among them. In this sense, WONCA's tree also has intrinsic PH care value.

McWhiney (2012), an eminent professor, described the family doctor as an “ecologist by nature”, underpinning the central argument of this paper. However, his use of “ecologist” had a more local and community environmental health concern. It could be argued that the function of this paper is to expand McWhinney's understanding of ecology to include PH care. Currently, where pollution has no frontiers, the clinician must understand that proximal environmental problems are in fact consequences from distal global interdependencies of the Anthropocene. Primary care providers understand that it is not enough to treat downstream pollution and recognize its upstream challenges. The WONCA tree does not have any explicit characteristics or “leaves” focused on ecology. However, the longstanding efforts by Fernando's health care team to monitor and exterminate larvae and to prevent Dengue mosquitoes from harming Ana and Barbara's community are clearly proximal environmental health interventions about responsibility for the community's health, and about health and well-being promotion (the 2nd leaf upper top-down on the right). Motivated practitioners may want to expand well-being promotion beyond usual best practices, by role-modeling biking to work, greening the practice, etc. (Bansal & Blashki, 2022). We would suggest that the future WONCA tree could incorporate branches with flowers and fruits for environmental health and PH care.

Other symptoms of our planetary ill health, belong to more spiritual and existential threats. Eco-anxiety (anxiety about climate change and other ecological problems), and solastalgia (the grief of losing home environment), are already harming people. These issues will likely increasingly appear in clinicians' offices. The first leaf in the bottom right of the WONCA tree will deal with the existential crisis



related to down and upstream PH care. One way to deal with these problems is to find purpose, and perhaps nudging towards collective PH action could help. Research on these existential crises could include assessing whether OMfP prescribing PH action would reframe suffering. While robust evidence is still lacking, clinicians may consider exploring it within this dimension.

### **Seventh Lens: WONCA Curriculum**

There have been many calls to include climate change and PH in medical curricula, although questions remain on how best to introduce them. One option would be to “apply a planetary health lens to all clinical subjects, actively looking for links between ecosystems and health” (Moore, 2021). The family medicine curricula is ready and needs encouragement to include PH.

The European Academy of Teachers in Family Medicine and General Practice (WONCA/EURACT) undergraduate curriculum ([Figure 2](#)) is used here only to illustrate how primary care curricula may already contemplate evidence-based medicine, patient-centered care, primary care principles and the WONCA tree. The primary care derivate principle of PH care would fit transversally within this curriculum, by recognizing that the methods and targets of the family practice are at the core of patient-centered PH care. Teachers and students only need to “connect-the-dots” ([Figure 2](#)).

PH care specifics could easily be inserted into the curriculum to familiarize the learner with the concept, for example I) the “Knowing” dimension, could include environmental and social health determinants; II) in the “Comprehending” dimension, Actor-Network Theory clinical case studies (like Ana & Bárbara’s) could be fun and easy to teach patient-centered PH care within the other primary care principles (Barros, Camargo, 2022); III) in the “Applying” dimension, explaining how evidence-based medicine reduces overtreatment, and how this improves health equity and reduces healthcare carbon-footprint would introduce these concepts to the learner.

### **Eighth Lens: Sustainable Development Goal #3: Good Health and Well-Being**

The 17 Sustainable Development Goals (SDGs) constitute the United Nations “shared blueprint for peace and prosperity for people and the planet, now and into the future” (2. United Nations. Department of Economic and Social Affairs, 2022). These interdependent SDGs are: No poverty, Zero hunger, Good health and well-being, Quality education, Gender equality, Clean water and sanitation, Affordable and clean energy, Decent work and economic growth, Industry, innovation and infrastructure, Reduced Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land, Peace, Justice, and Strong Institutions, Partnerships for the Goals.

The health goal (SDG 3) is broad: Ensure healthy lives and promote well-being for all at all ages. The SDG declaration emphasizes that to achieve the overall health goal, we must achieve universal health coverage and access to quality health care. In our case study, SDG3 is seen in action through Fernando’s effort to protect Ana & Bárbara’s health. Furthermore, [Figure 1](#) suggests how SDGs are present, in an implicit way, entangled in Ana & Bárbara’s case. That is, achieving sustainable development targets will enable better patient-centered PH care to Ana & Bárbara. Perhaps the most obvious aspect of the SDGs is the need for intersectoral partnerships; likewise, primary care providers can inspire community and PH intersectoral action.

### **LIMITATIONS OF CASE STUDY**

Patient-centered PH care is an innovative framework with an urgent imperative to be integrated into primary care. We will discuss limitations that should be addressed by other primary care providers and academic investigators.

The patient-centered PH care framework has been matured through many lectures and discussions with students and colleagues from many different healthcare and scientific perspectives. The framework is structured on recommendations from



WONCA despite being intended for all primary care providers. As a writer suggested, “if you want to be universal, write about your village.”

One notable limitation is that Lenses 6 and 7 are nominally specific to family doctors/general practitioners, and although they can be applied to other primary care providers. The authors acknowledge there may be more appropriate frameworks to explicitly include all primary care providers. WONCA’s definitions of lenses 6 and 7 were used because of the authors’ familiarity with the chosen frameworks. The same with the framework of evidence-based medicine, which is a method intended for all healthcare providers. We are not aware of but would prefer other equivalent robust and widespread models that would include explicitly all primary care clinicians. These 8 lenses are not meant to be a static model for the adequacy of patient-centered PH care and OMfP, but a starting point for future conceptualization, research, and development.

Another important limitation is the assumption that Fernando’s primary care services are of adequate quality. The objective quality of primary care in a community is measured by the PCATool (Primary Care Assessment Tool), which quantifies the effectiveness of the primary care principles. (Starfield, 2012) As Fernando, the clinician in this case study, has not utilized the PCATool, the assumption of good quality is based on subjective experiences, such as subjective knowledge of international standards, and comparisons to other primary care services in Brazil and abroad. An outstanding characteristic of Fernando’s outpatient clinic is the interdisciplinary collaboration with nurses and community health workers. This is standard care in Brazil’s public healthcare and improves all attributes of primary care.

Another weakness is the type of clinical condition. Dengue and Long Covid, have both didactic advantages and disadvantages. Dengue and SARS-COV2 relationship to planetary health is easy to demonstrate. The frailty is because many will have difficulty transposing the lessons from this case to other clinical conditions such as chronic non-communicable diseases. The challenge of visualizing

these interdependencies can be worked out with Actor-Network Theory (Barros & Camargo, 2021).

One recurrent criticism from colleagues and students is that it is futile to see the patient from the perspective of the upstream determinants of planetary health, and even more futile to expect that the patient-clinician interaction would have any positive impact on the planet. However, the answer is in the proposed framework of patient-centered PH care, which emphasizes that individual patients do suffer from harmful human-planet interactions, and that PH care, just as community care, does improve with benevolent collective action. Examples, such as the Montreal protocol to reverse Ozone depletion, are abundant. Every contribution matters.

### IMPLICATIONS

Family doctors/general practitioners are obliged by the Hippocratic oath to look to the planet from the perspective and values of the patient. Additionally, the framework of patient-centered PH care implies that there may be no dichotomy between patient and planet, just as community and family dimensions are integral to good patient care. It is important to recognise interconnectedness between the part (patient) and the whole (planet), just as interconnection within nature and complex systems thinking takes the forefront in advanced Earth and health sciences (Greene & Loscalzo, 2017). Holistic care is the ability to dynamically connect-the-dots across silos in practice, a core competency of family doctors. Ultimately, the proposed new primary care derivative principle of PH care may go beyond the notion of patient-planetary health co-benefits, which could sound to some like two different pathways running parallel to each other. Instead, this proposed principle brings to light the scientific construct that the health of the patient-planet is entangled in a continuum. The end and the beginning of this entanglement depend on the cultural/cosmological perspective defined by the patient - a fundament that primary care providers must respect. (Redvers, 2021)

This clinical case report utilized 8 lenses to connect-the-dots of patient-centered PH care. Every lens offers a complementary perspective and



pathway to improve PH action in primary care, including suggestions for a research agenda.

Furthermore, these lenses depict the positive intrinsic and passive value of primary care principles and stimulate clinicians to meditate on how patient-centered PH care is emerging in their own practices, and already acting as a new primary care principle of PH care. Formalization and acceptance of PH care as a new primary care derivative principle demands rigorous interdisciplinary research to delineate its position and relevance in primary care. Presently, it is currently implied as good practice by WONCA's recognition of the climate emergency (WONCA, 2019) and call for PH action (Iacobucci, 2019). In the future, WONCA may consider officialising PH care as the eighth primary care principle and foster a robust identity for the challenges of the climate emergency and Anthropocene.

Primary care clinician's self-awareness as champions of PH care at the community level may help to identify strengths, weaknesses, opportunities, and threats to advance the agenda of patient-centered PH care. There are still many unexplored potential areas for innovation such as the project in the tropical forest of Borneo, where the human-centered solution implementation of primary care seemed to reduce deforestation due to less dependency on logging money for basic needs (Jones et al, 2020). The science evidence is robust; therefore, this identity should be recognized by patients, healthcare professionals, academics, industry, and policy makers to accelerate investments in primary care in proportion to the emergency of climate change and Anthropocene challenges.

### CONCLUSION

This case study offers a blueprint, and a roadmap of how primary care can mitigate climate change (e.g., avoiding health hyper consumerism, overtreatment, healthcare overuse, higher energy hospital centrism, reducing deforestation, ect), advance adaptation (address underuse of healthcare services, higher quality healthcare closer to disaster-vulnerable communities), and build resilience (community comprehensive health services that are effective in responding climate change). This intersects with

SDG3, reinforcing that all concerned with the challenges of the Anthropocene should strive for high quality primary care based universal health coverage. The identification of primary care providers as champions of PH action may help change the mindset of healthcare stakeholders - from patients, doctors, industry, and policy makers - to prioritize primary care to advance health equity and protect planetary natural systems.

Every primary care provider who strives for best practices, avoiding overtreatment, sharing decision-making and advocating for stronger primary care principles is increasing health equity and reducing the healthcare eco-footprint - two core targets of patient-centered PH care. Including OMfP in clinical practice would be the "cherry on the cake". Imagine trusted primary care providers in every community around the world (family doctors/general practitioners alone represent over 500,000 clinicians worldwide) encouraging their patients toward PH action.

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Figure 1. WONCA tree of core competencies and characteristics

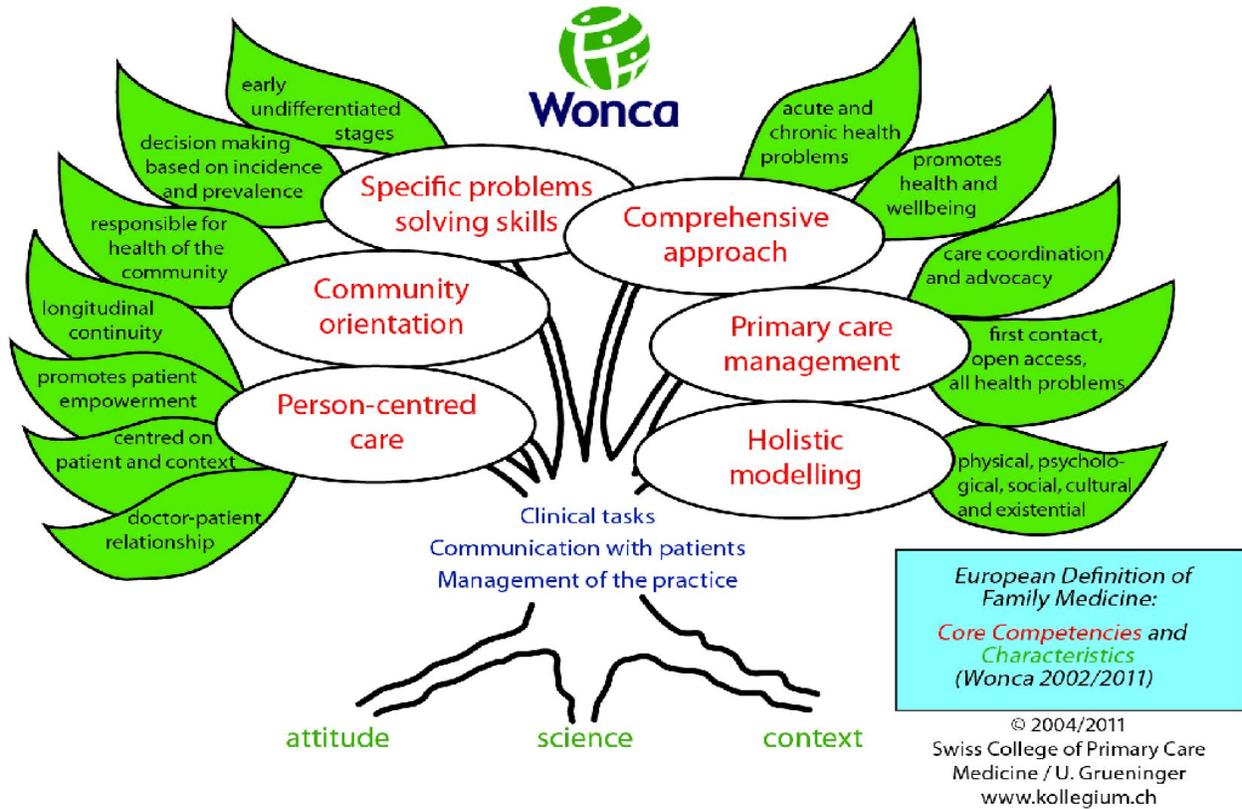




Figure 2. WONCA Three Dimension Curriculum

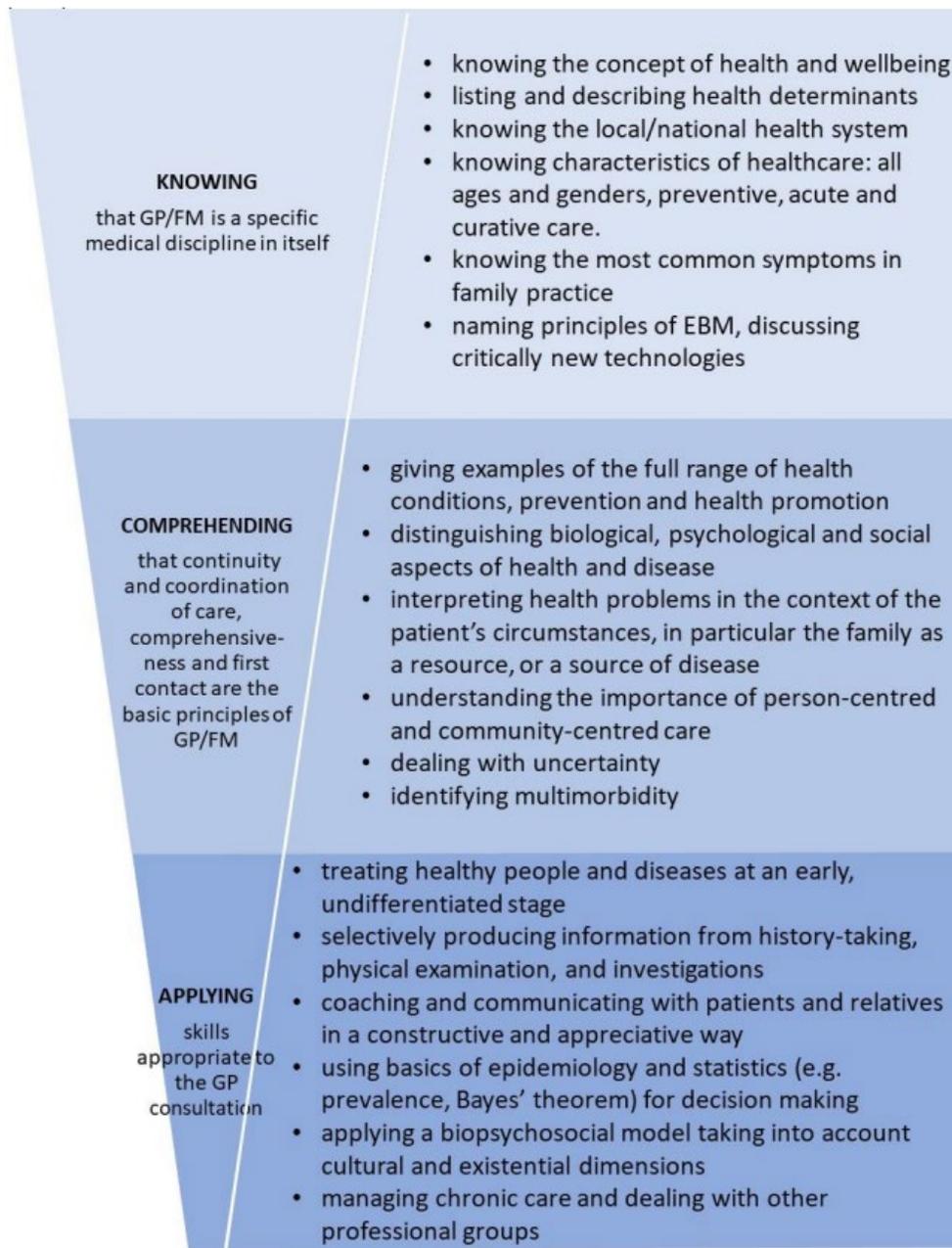


Figure 3. Actor-Network Theory

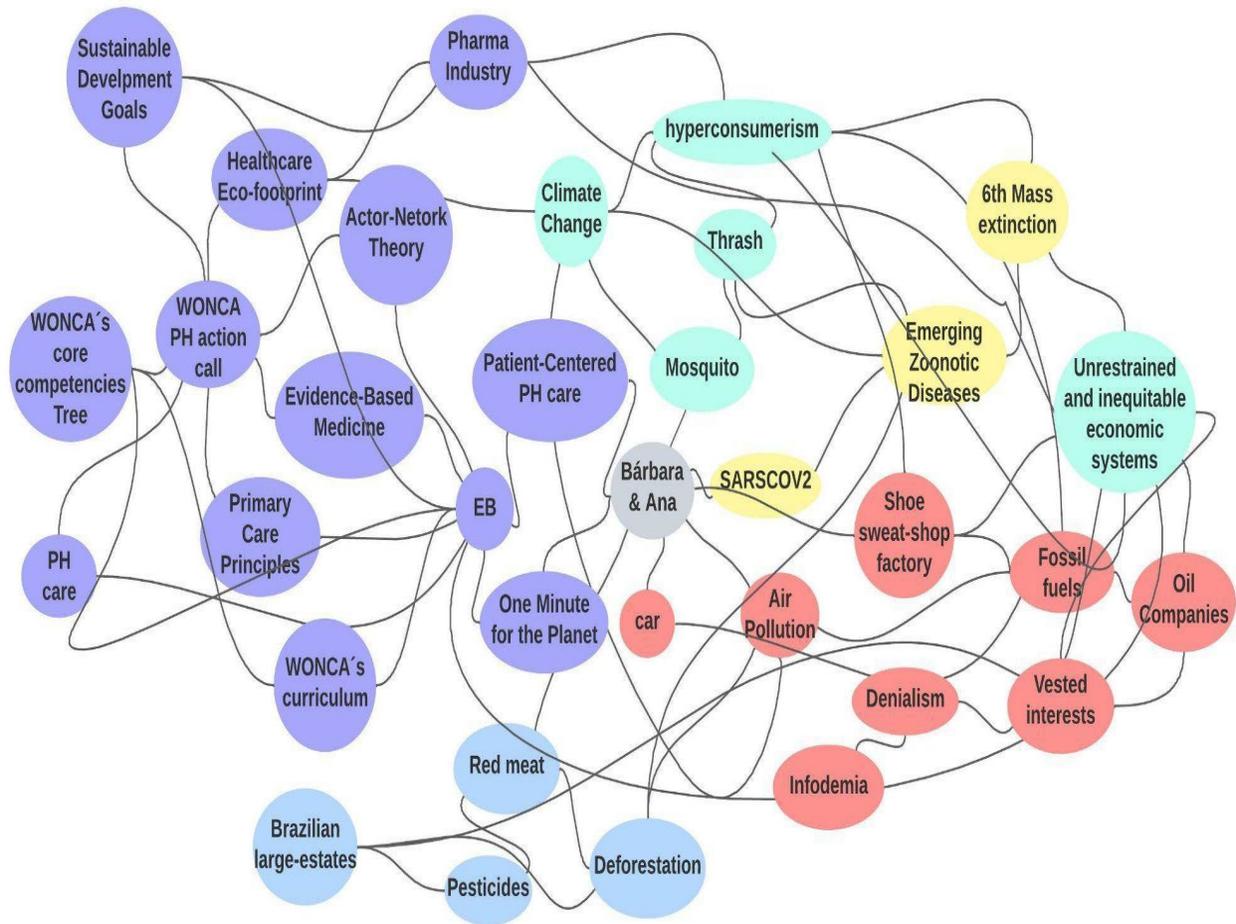




Figure 4. Patient-Centered Planetary Health Care

