



## CLIMATE CHANGEMAKERS IN HEALTH



## CONTENT

### EDITORIAL - 2

#### PRACTICAL PAPERS

Ophthalmology and the climate crisis... we should take responsibility - 3

Healthcare's contribution to climate change - 6

Don't waste a pill: initiatives for sustainable medication use - 11

#### OPINIONS

Beyond planetary health: the limits to biomedicine and economic growth - 8

Climate change and planetary health: a view from the Philippines - 12

What kind of climate science for what kind of action? Integrating science, community and culture for climate justice - 14

#### KCGH

Networking and sharing knowledge for health sector sustainability - 16

#### WORKING GROUP

The link between climate justice and public health policies - 17

#### GLOBAL HEALTH RESIDENCY PROGRAMME

Decision-to-delivery interval in emergency caesarean section in a district hospital in Ghana - 19

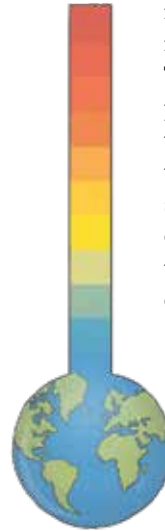
#### INTERVIEW

Reflections on MTb: an interview with Leon Bijlmakers - 22

## CODE RED: ACTION FOR CLIMATE HEALTH

**T**his edition of MTb can be seen as a follow-up to the edition *Climate change and health* that we published in 2019, an edition in which we, in parallel with the NVTG symposium, presented articles on the climate changes that we all are experiencing and their impact on human/planetary health. In the past months, many events took place that highlighted the devastating effects of climate change on the social and environmental determinants of health. But this time it's more imperative than ever to join forces to stop global temperature rise, or at least keep it at 1.5 degrees maximum, and to mobilise resources to deal with the direct effects of climate change, in particular in those countries that disproportionately are bearing the brunt. Humanity is facing its biggest health threat ever, and the World Health Organization and others are urging us to act, and act quickly.

In the short to medium term, this implies actions to address the needs of the "vulnerable populations, people in low-income and disadvantaged countries and communities".<sup>[1]</sup> In the longer term, the effects of our actions will depend on our ability to reduce emissions and to halt rising temperatures. The *Lancet* report (CODE RED) formulates our response to both crises (climate change and Covid-19) as "an unprecedented opportunity to ensure a healthy future for all".<sup>[3]</sup>



Two years down the line, we take note of 'climate action' in different forms and on different platforms. This MTb focuses less on clinical practice and is more of a compilation of opinions on how to frame the debate – including political standpoints – and of reflections on recent events that address the urgency. In addition, we present case studies and experiences with actions from within the health sector to reduce the carbon footprint. Also, we offer the floor to differing opinions on how to frame the crisis which, as you all know, is a hot topic of debate.

Hope you enjoy the read and, last but not least, on behalf of the editorial board, we wish you all a prosperous, healthy and happy 2022!

Esther Jurgens, Olga Knaven

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# Ophthalmology and the climate crisis... we should take responsibility

Last September, over 200 scientific medical journals worldwide simultaneously published a *Call for emergency action to limit global temperature increases, restore biodiversity, and protect health*. In these papers, editors call for governments and other leaders to act on keeping global temperature rise below 1.5°C and on restoring nature. Science is unequivocal; a global increase of 1.5°C above the pre-industrial average and the continued loss of biodiversity risk catastrophic harm to health.<sup>[1]</sup>

Climate change is already impacting health in a myriad of ways, including death and illness from increasingly frequent extreme weather events such as: heatwaves, storms and floods; the disruption of food systems; increases in zoonoses and food-, water- and vector-borne diseases; and mental health issues. Furthermore, climate change is undermining many of the

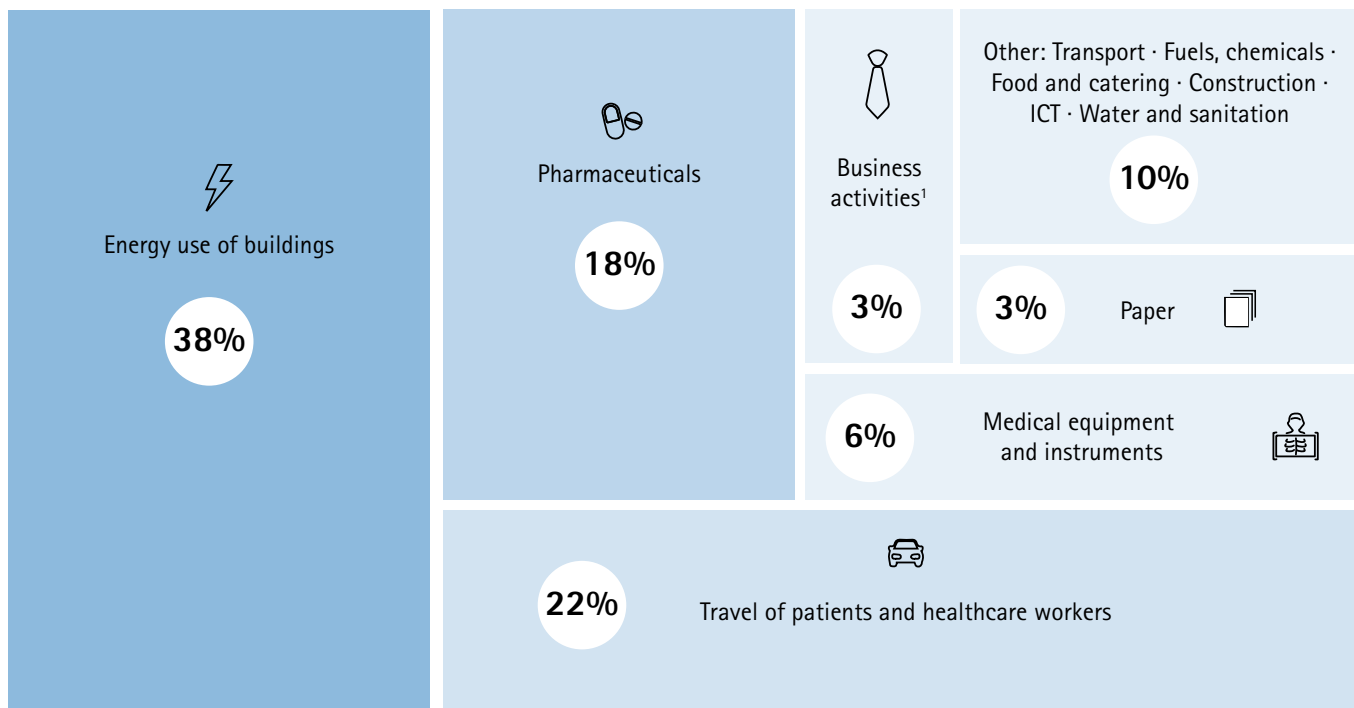
social determinants for good health, such as livelihoods, equality and access to healthcare and social support structures. Despite the world's necessary preoccupation with Covid-19, we cannot wait for the pandemic to end and must rapidly reduce greenhouse gas (GHG) emissions.

The healthcare sector is a major contributor to greenhouse gas emissions.<sup>[2]</sup> It is estimated that healthcare's climate footprint is equivalent to 4.4% of global net emissions (two gigatons of carbon dioxide equivalent). If the health sector were a country, it would be the fifth-largest emitter on the planet. So, the healthcare system itself contributes to a decline in public health. This message has been heard by leaders in the field. During the recent COP26 UN Climate Change Conference in Glasgow, a group of fifty countries committed to developing climate-resilient and low-carbon healthcare systems. Previously, a target

of net zero greenhouse gas emissions in the year 2030 was adopted by the National Health Service in the United Kingdom (UK). In the Netherlands, all major players in the healthcare sector signed the Green Deal, committing themselves to a 50% reduction in carbon footprint by the year 2030.

## ROLE OF OPHTHALMOLOGISTS

Important sources of healthcare related carbon emissions are energy consumption, medication, disposables, and patient travel (Figure 1).<sup>[3]</sup> Although ophthalmology is a small medical specialty, it contributes significantly to all these components. It has the highest surgical volumes in medicine and use of energy-consuming operating rooms; single-use products are increasingly used; large amounts of (single-dose) eye drops are prescribed; and many patients are invited to the clinics. Fortunately, there are ways to improve sustainability within the ophthalmology department.



\* Percentage: 100% = 11 megaton CO<sub>2</sub>

\*\* R&D, consultancy, insurance, legal services, marketing, cleaning, etc.

Figure 1. Proportion of the total carbon footprint of Dutch healthcare sector.\* Source: Gupta Strategists, *Transition to a sustainable healthcare*, May 2019 (In Dutch).





Figure 2. Differences in amount of waste after a phacoemulsification between USA and India.

## AREAS OF IMPROVEMENT

### AIR CONDITIONING IN THE OPERATING ROOM

In the Netherlands, the recommendation for the air handling system of air ventilation in the operating room (OR) is currently under consideration for being changed to a lower level (to an air change rate of at least six per hour). Apart from this, the air conditioning should be turned off when the OR is not in use. Research shows that shutting down OR ventilation during off-duty periods does not appear to result in unacceptable high particle count or microbial contamination of OR air thirty minutes after the system is restarted.

<sup>[4]</sup> This will not only save GHG emissions but money as well. Moreover, since the air conditioning consumes more than 90% of the total energy use of the OR, it is critical to choose for renewable energy instead of fossil-based energy. Hospital managements should be pushed to buy 100% green energy.

### WASTE IN CATARACT SURGERY

One phaco-procedure in the UK produces around 130 kilograms CO<sub>2</sub>, equivalent to a car ride of 500 kilometres. More than 50% of this is due to procurement.<sup>[5]</sup> Disposable instruments can account for 10-20 times as much waste as reusable items.<sup>[6]</sup> Furthermore, all disposables are clinically contaminated waste which must be incinerated or burned, producing large amounts of greenhouse gasses.

It is feasible to lower the carbon footprint of cataract surgery. This has

been shown by the Aravind Eye Care System in Southern India. Aravind performs around a thousand surgeries per day, and they generate 250 grams of waste and nearly 6 kilograms of carbon dioxide equivalents in GHGs per phacoemulsification (Figure 2). This carbon footprint is approximately 5% of that in the UK. Many differences can account for this low carbon footprint, including efficient, high-volume logistics and the reuse of instruments, protective equipment and medicines.

These differences do not affect surgical outcomes such as visual acuity or infection prevention. According to Chang<sup>[7]</sup>, the endophthalmitis risk after a phaco in Aravind is 0.01%, which is lower than the 0.04% in the United States of America (USA).<sup>[7]</sup> This fact can partly be explained by the standard use of intracameral moxifloxacin in Aravind, a drug that is not registered in the USA due to the lack of adequate randomised controlled trials. Chang concludes that the rigid adherence to single-use material creates an excessive amount of surgical waste at a high cost, with no proven benefit in postoperative endophthalmitis risk.

Some colleagues argue that disposables are safer than reusables and should therefore be promoted.<sup>[9]</sup> However, a large survey among more than 1,300 USA cataract surgeons and nurses showed that 93% believe that operating room waste is excessive and should be reduced.<sup>[10]</sup> More specifically, 78%

believed that supplies should be reused more frequently, and 87% wanted medical societies to advocate for reducing the surgical carbon footprint. Assuming comparable cost, 79% of surgeons preferred reusable over disposable instruments. They are supported by the lack of evidence that disposable instruments are safer for patients, so their use should be discouraged instead of promoted.

### MEDICATION

It is important to consider the reduce, reuse and recycle rationale for medication use in ophthalmology as well. Tauber et al. showed that in different settings for cataract surgery a large proportion of the medication used pre- and intraoperatively is discarded.<sup>[11]</sup> This was the case for eyedrops, injections and systemics, with percentages ranging from 78% to 5%. Discarded topical eye drops were the most costly, with a total cost averaging 148 US dollars per case. Reasons for discarding these medications could be a lack of counselling for patients, lack of medication labelling, facility policies, and noncompliance with burdensome state requirements.<sup>[12]</sup>

In addition, one should consider whether post-operative antibiotic eye-drops are still necessary when peroperative intracameral antibiotics are used as well. Every ophthalmologist should consider whether reusing multidose medication on multiple patients is possible. In many clinics, for instance, it is OR policy to throw medication away after it has been opened for a

single patient. However, it is important to examine the justification of these policies. Chambers, in his editorial (*Ophthalmology* 2021) shows that this justification is not a scientifically based study, but rather a misinterpretation. He explains that manufacturers of multiple-dose ophthalmic products are required (by the Federal Register) to use an antimicrobial preservative which minimises the chances of injury to the patient should a contamination event occur. This additional level of protection also enables the drug product to be administered to multiple different patients over the course of time until the bottle's stated expiration date.<sup>[13]</sup> Each ophthalmologist should consider whether she/he has the possibility of reusing their multi dose medication.

#### TRANSPORT

The Covid-19 pandemic has shown that remote care of patients by the use of telemedicine is also possible for ophthalmologists.<sup>[14]</sup> Telephone calls and video visits can help to review test results, check on medication adherence, triage patients, or replace check-ups to reduce the number of hospital visits.

Another lesson learned from the Covid-19 pandemic is that online meetings and conferences are feasible. This could also be extended to international meetings and conferences; even a national gathering to watch lectures and discussions abroad may be a reasonable alternative for many attendants. Online meetings have pros and cons, but they certainly cause less GHG emissions compared to long distance travel.<sup>[15]</sup> Having thousands of ophthalmologists fly abroad to attend a medical congress is simply not sustainable and not justifiable in these times.<sup>[16]</sup>

#### CONCLUSION

Ophthalmologists are continuously trying to improve the quality of care and keep the healthcare system affordable and accessible for future generations. If the carbon footprint of clinical practice is not lowered, the healthcare system will be compromised. We, ophthalmologists but also other healthcare professionals, should evaluate our own actions, both private and professional,

and take into account our carbon footprint. Only by doing so can we act according to the oath we swore: *primum non nocere* (first, do no harm).



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#### FOUNDERS OF THE DUTCH WORKING GROUP ON SUSTAINABLE OPHTHALMOLOGY

The Dutch Working Group on Sustainable Ophthalmology was founded in 2019. The aim of this group is to promote the transition to a sustainable clinical practice within our medical specialty. The group also promotes research, provides information and coordinates action. Based on current guidelines and scientific consensus and respect for patient safety, the group has written directions for a safe and sustainable implementation of common ophthalmological procedures. Examples are intravitreal injections, cataract surgery, and patient gowns during surgery. The national association, the Netherlands Ophthalmological Society, has adopted and recommended these best practices, with a growing number of hospitals implementing them. Recently, Dutch health insurance companies have shown interest in promoting these best practices.

<https://www.oogheekunde.org/projectgroep-duurzame-oogheekunde>

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# Healthcare's contribution to climate change

The climate crisis unequally affects low- and middle-income countries (LMICs) causing natural disasters, the spread of infectious diseases, and environmental pollution.<sup>[1]</sup> These countries contribute to substantially fewer emissions responsible for causing the climate crisis than high-income countries. Meanwhile, LMICs have fewer options to protect themselves against ecological threats.

Rising temperatures due to global warming cause an increase in health related morbidity and mortality. Moreover, rising temperatures and extreme weather events like flood and drought influence drinking water quality as well as crop and livestock productivity. These natural disasters lead to food insecurity, water stress and eventually forced migration. The number of climate refugees is predicted to reach more than one billion by 2050. Also, countries that experience lots of ecological threats have a relatively high number of conflicts.<sup>[1,2]</sup>

## HEALTH PARADOX

The healthcare system contributes a great deal to carbon emissions linked with the climate crisis. The Dutch healthcare sector is responsible for as much as 7% of national CO<sub>2</sub> emissions.<sup>[3]</sup> This implies a health paradox: on one hand, the healthcare sector promotes health and provides treatment for disease, while on the other hand it contributes to the climate crisis causing CO<sub>2</sub> emissions, which have a detrimental impact on global health.

## GREEN DEAL

In 2018, more than 150 healthcare organisations signed the *Green Deal (2.0)* in the Netherlands, a pledge for more sustainable healthcare. The Green Deal is divided into themes, or pillars: reducing CO<sub>2</sub> emissions (pillar 1), producing less waste and reusing more materials and products, also called circularity (pillar 2), ensuring

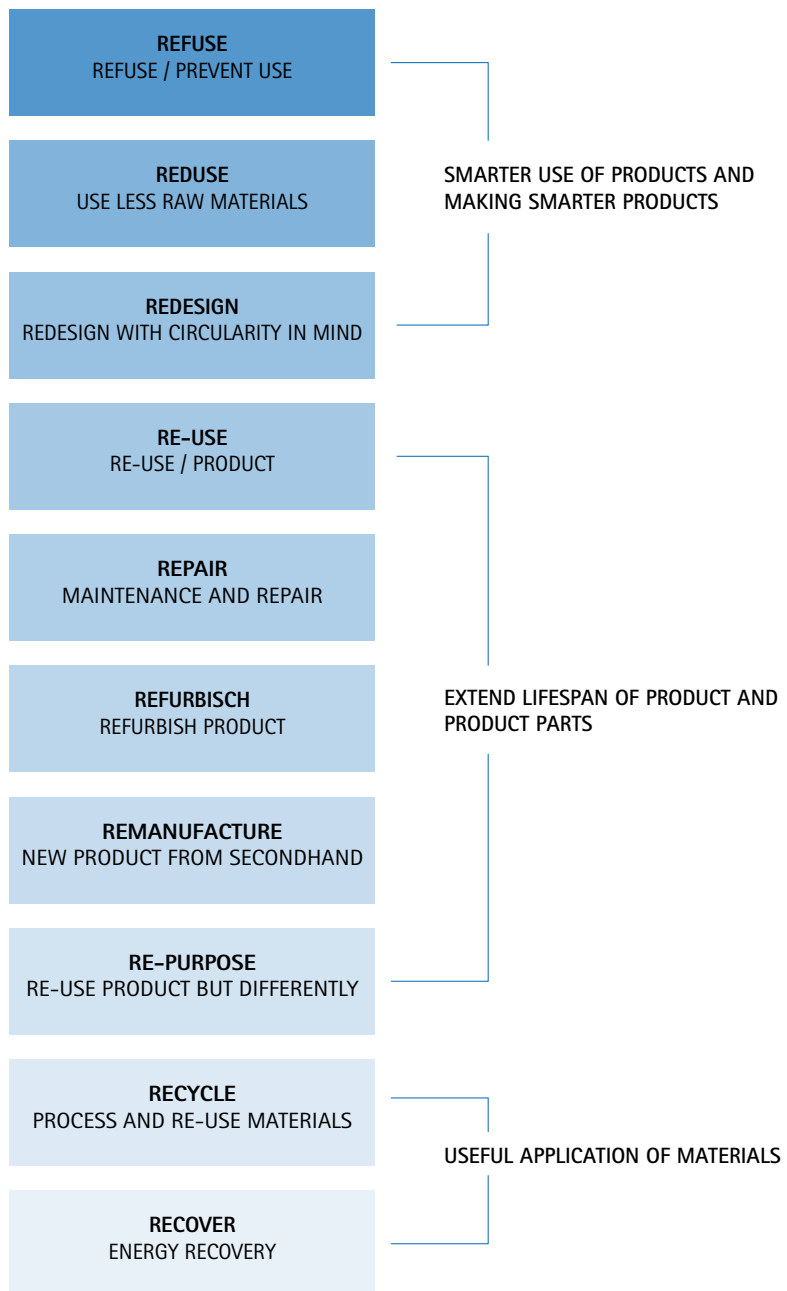


Figure 1. The 10R stepwise scheme of circularity

that less residual medicine finds its way into waste water (pillar 3) and promoting a healthy environment.<sup>[4]</sup> We will describe these four themes of the green deal in detail below. These themes play an important role in the Dutch healthcare system with its disposables and prescriptions for chronic diseases, and on a smaller scale in tropical medicine settings.

## CO<sub>2</sub> REDUCTION

Annually the Dutch healthcare sector emits eleven megatons of CO<sub>2</sub>. Most of these CO<sub>2</sub> emissions result from energy consumption (like heating and lighting) of buildings (38%), travel of patients and commuting traffic of healthcare workers (22%), and drug production (18%).<sup>[3]</sup> These numbers include emissions from supply chains. Energy use varies greatly

between hospitals. Generic measures such as insulating buildings and using renewable energy and energy-efficient devices provide opportunities for huge reductions. In the travel category, health-care workers cause most emissions. Therefore, changing their transportation methods and working (partly) from home are important themes to decrease the use of fossil fuels. Additionally, international conferences cause a huge amount of CO<sub>2</sub> emissions from flights by participants.<sup>[5]</sup> Online conference attendance dramatically reduces emissions by eliminating air travel. In drug production, the part responsible for the biggest emission of CO<sub>2</sub> is production of the required raw materials. Switching to less harmful alternatives is particularly important for inhalers and anaesthetics. Inhalational anaesthetics are very potent greenhouse gases and can be replaced by intravenous options.<sup>[6]</sup>

#### CIRCULARITY

Circularity means a closed loop of continuous reuse of resources, where no waste is created. Mining of raw materials is associated with negative effects on the climate and poor working conditions with exposure to environmental health hazards in the mining countries. In the Dutch healthcare system, a lot of (mainly plastic) waste can be recycled. Instead, most waste is currently burned, which results in CO<sub>2</sub> emission. Waste that ends up in the environment pollutes water and soil with harmful substances or (micro)plastics. Circularity is not just recycling. In fact, recycling is just one of the last steps in circularity. The Utrecht Sustainability Institute developed a ten-step priority scheme (Figure 1).<sup>[7]</sup> The shorter 3R principle is well known: reduce, reuse, recycle. The most important steps include: reduced demand for materials, increased life span, reusing and ultimately recycling materials. An average Dutch hospital bed produces 250 to 300 kg waste per year<sup>[8]</sup>, emphasising the urgent need to rethink how we purchase and use disposables and handle waste in health care.

#### RESIDUAL MEDICINE IN WASTE WATER

In addition to the harmful effects of drug production as explained in the first pillar (CO<sub>2</sub> reduction), drugs can also be

harmful after use. Annually, a total of 190,000 kg of human drugs and drug waste (degradation products)<sup>[9]</sup> enter the waste water system in the Netherlands. Many drug degradation products are eliminated via patients' urine and faeces. Waste water filtration systems were not designed to filter medication, and approximately 35% of waste water drugs end up in open waters. These drugs and drug waste disturb biodiversity in the water. Although concentrations are generally low, the effect appears to be substantial. Only a few drugs are subject to European norms for safe concentrations, and the environmental effects of many drugs and their degradation products are unknown.

Antibiotics affect cyanobacteria, and antidepressants affect the behaviour of various organisms.<sup>[9]</sup> Tap water contains low concentrations of drugs and radiologic contrast agents. Concentrations in tap water are expected to increase due to the aging population and the expected increase of medication use in the future. Higher concentrations are probably needed to affect human health, but the effect of long-term exposure to low (but increasing) concentrations of these substances is unknown. This could possibly make water temporarily unsuitable for drinking water preparation in future.

In the case of residual medicine in waste water, a collective approach is important. Various actions need to be taken within the framework of production, prescription and water purification strategies.

Many clinicians and healthcare professionals argue for strengthening preventive medicine and treating diseases with lifestyle changes. This eliminates the need for medicine and therefore reduces residual medicine in waste water and CO<sub>2</sub> emissions in general.

#### HEALTHY ENVIRONMENT

A healthy environment improves the wellbeing and health of patients and healthcare workers. Patients in a natural environment required less analgesics after surgery.<sup>[10]</sup> Green rooftops on hospital buildings improve insulation, temperature management, biodiversity and noise levels.<sup>[11]</sup>

Sustainable and healthy nutrition is documented in the *Nationaal Preventieakkoord. Naar een gezonder Nederland* (National Prevention Agreement for a healthier Netherlands), which states that all Dutch hospitals should serve mainly healthy food by 2030. Nutrition has a major effect on CO<sub>2</sub> emission, specifically through food waste and the use of animal products. By eliminating meat consumption, you can halve your nutritional CO<sub>2</sub> footprint.<sup>[12]</sup> In conclusion, a healthy environment contributes to the reduction of the psychological effects of illness: stress, anxiety and (un)wellbeing.

#### WHAT CAN WE DO?

The healthcare sector can and should be more sustainable. The climate crisis is an undeniable threat to public health. As healthcare professionals, we therefore have an important task in the fight against climate change. For young doctors, mostly working in temporary positions, the climate crisis may feel so overwhelming that they might doubt the impact of their small actions. However, they can make a difference immediately: by changing small daily routines, inspiring colleagues, contributing to a green initiative, or by setting up a sustainable project.

#### PRACTICAL TIPS

- Consider the online option for your next conference and participate together with local colleagues.
- Commit to separating waste at your workplace, particularly plastic and non-contaminated waste.
- Bring your own water bottle and coffee cup instead of disposable cups.
- Take your bike to work and find yourself a green route.

*Article continues on the next page.*<sup>[11]</sup>





# Beyond planetary health: the limits to biomedicine and economic growth

At the moment of writing, the Covid-19 pandemic has, once again, tightened its grip on European society. The Netherlands has entered another lockdown, and the Omicron Variant of Concern has led countries to impose entry restrictions, especially for travellers from Southern Africa. The public debate is focused on the need for increasing vaccination coverage, booster regimes, testing options, and amending the digital green Covid-19 certificate so as to safeguard public health outcomes and health system integrity (notably intensive care beds capacity), while keeping the economy afloat. Public authorities were and are busy deciding whether Christmas markets can remain open, and whether European citizens can still plan holiday trips and restaurant visits during this winter season.

De Jonge Specialist (The Young Specialist), the professional association for physicians in training for a specialty and physicians not in training for a specialty in the Netherlands, launched a committee – the Green Healthcare Committee – of young green-hearted doctors to bring sustainability to the attention of its members. The Green Healthcare Committee published a guide with practical tips, inspiring examples and green pioneers collected from throughout the Dutch healthcare system. This guide, called *Groen, groener, groenst: handreiking voor a(n)ios die de zorg willen verduurzamen* (Green, greener, greenest: a guide for physicians in training for a specialty and physicians not in training for a specialty who wish to make healthcare more sustainable), is a leading document to inform and motivate young doctors to contribute to a greener healthcare system. Be inspired and shoulder your responsibility as a healthcare professional! The guide is written in Dutch and can be found here ([www.dejongespecialist.nl/2021/de-jonge-specialist-gaat-groen-groener-groenst/](http://www.dejongespecialist.nl/2021/de-jonge-specialist-gaat-groen-groener-groenst/)) or scan the QR code (Figure 2).



Figure 2. QR code referring to the practical *Groen, groener, groenst: handreiking voor a(n)ios die de zorg willen verduurzamen*

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I have difficulty with this rather narrow and shallow debate on how to address the pandemic. My unease is rooted in the observation that we are trying to address symptoms, but completely overlooking the diagnosis and systematic disease it represents. The Covid-19 pandemic did not emerge out of the blue. It revealed a broken system of economic hyper-globalisation. The pandemic demonstrates the interconnection between humankind, animals and other living beings on the one hand and the environment on the other. Deforestation, climate change and the ever-increasing destruction of natural life, resource-intensive lifestyles, and unsustainable food production and consumption systems have been the root cause of the emergence of zoonoses since the beginning of the new millennium.<sup>[1]</sup> The declining biodiversity, linked to industrial agriculture and intensive livestock breeding, is a major driver of spill-overs of infectious diseases: the devastation of forests for palm oil plantations enabled the ecological conditions for the spreading of Ebola and Nipah viruses. These can now more easily ‘jump’ the species barrier between bats and humans.

<sup>[2]</sup> Covid-19 is therefore one more manifestation of the Anthropocene.

The earth-system scientist Johan Rockstrom points out that the Covid-19 pandemic should make us recognise that we are moving beyond the point of planetary saturation.<sup>[3]</sup> At the opening of the World Health Organization (WHO) Global Conference on Health and Climate Change – organised in the context of the COP26 United Nations Climate Change Conference in Glasgow – WHO Director General Tedros declared “Climate change is a health crisis”. He also stated that a failure to address pandemics and climate change as complex interrelated issues is likely to lead to false preparedness and response strategies.<sup>[4]</sup>

#### THE PLANETARY HEALTH APPEAL

The international public health community has, over the last years, taken a much-needed interest in the interrelations between climate change and health outcomes. This is evident in academic publications such as the

Lancet Countdown on health and climate change<sup>[5]</sup>. In the Netherlands, health professionals, practitioners and researchers have established the ‘Zorg voor Klimaat’ (Care for Climate) network.<sup>[6]</sup> We are witnessing an expanding, transdisciplinary, academic and educational planetary health community.<sup>[7]</sup> The Belgian Platform for International Health recently organised a climate justice and health equity conference.<sup>[8]</sup> Likewise, in the Netherlands there is new attention and synthesised evidence on the interrelation between climate change and (public) health outcomes.<sup>[9]</sup>

Despite all these efforts, there is still an elephant hiding in the room which needs to be tackled head-on in order to enable the urgently needed transformational change. The elephant is known as ‘capitalist economic growth’. Many of the policies and concepts that form the basis of among others the sustainable development goals, the planetary health discipline, and current pandemic preparedness and response plans are built on an (implicit) assumption of the possibility of an ‘inclusive and green growth’ approach. Often this is embedded in an innovative and ‘technology savvy’ digital project, e.g. a smartphone app that enables the sharing of electronic bikes, rapid diagnostic tests for malaria, etc.

To quote critical research on the planetary health paradigm:

“Based on a depoliticised and ahistorical conception of the ecological crisis, it naturalises capital and the technosciences. Instead of focusing on limits – physical and natural, moral and political – that humanity could set in its relationship to nature and to itself, Planetary Health proposes instead to push these limits further through a techno-financial resilience that celebrates our ability to emerge from the crisis through a new cycle of capitalist accumulation.”<sup>[10]</sup>

#### DEGROWTH AND HEALTH

With this political-economic understanding of health and the biomedical sciences in mind, I have been fortunate to work over the last years with a relatively small community of researchers,

students and activists (the Commons Network) on a different health and care discourse. This can be summarised as a post-growth movement, one that merges alternative planetary health concepts with feminist economics and communing practices in the care domain. One of the key questions that this community asks is the following: *If a growth-centred economic system is making us and the planet sick, what can we do to transform it?* In a new report published by the Commons Network, we explore what it means to move beyond growth, towards a vision of society and health that is centred around three core values: care, autonomy, and sufficiency.<sup>[11]</sup>

The degrowth movement representing these values has its roots in the 1970s and enables us to unlearn that economic growth is desirable.<sup>[12]</sup> This presents a different expression of the economy as a social construct, as a means rather than a goal in itself. The Commons Network provides a space where communities have autonomy, steward resources collectively, and initiate activity, communication and democratic stewardship. By focusing on community life, localising economic activities, and using resources in a more sustainable manner, the act of organising healthcare through Commons promotes a shift to a more ecological economy, one more in line with degrowth’s core value of sufficiency. The report by the Commons Network provides case studies of autonomous citizen’s (social and health) care initiatives in the Netherlands. There, self-organised care works because it is local and often place-based, but also because it is freed from the bureaucratic government system. Focusing on reciprocal caring practices means moving away from transactional relationships in a community, away from the ethic of productivity and individualism, and towards an ethic of non-exploitation.<sup>[11]</sup>

Contemporary degrowth research and healthcare activities often use European ‘commoning’ examples as an entry point, but actually they are rooted in (often valuable) lessons from non-European contexts. These lessons, although each deserves an article on its own, can be summarised in three points.



First, in public health, we need to actively challenge *the (unspoken) issue of supremacy and discrimination* in international collaborations, as powerful positions, finance and leadership are mostly still dominated by global health practitioners from high-income countries. Black, indigenous, and other people of colour, often women, are the real leaders of global public health and their wisdom needs to be given priority in decolonising this domain.<sup>[13]</sup>

Secondly, the rather narrow reductionist biomedical approach, so much fostered and replicated by European actors elsewhere, must give space to *plurality, diversity and holistic forms* of knowledge and concepts of what health and wellbeing entails. This could include traditional, indigenous and valuable socio-cultural visions on how to respect human, planetary and economic limits, thereby reaching a much more balanced, healthy and harmonious mode of living together.<sup>[14]</sup>

Lastly, through international medical, development and corporate practices we should, as a core value and principle, take notion of “first, do no harm”. Let’s apply this to the ongoing pandemic and what is required to prevent and respond to this and future public health emergencies in a just manner. Such ethical values would imply supporting a temporary waiver of intellectual property rights of vaccines and other medical products during the time of the pandemic. However, even during this crisis, the monopolistic capitalist model of medicines research and development (R&D) and production continues to be dominated by Western pharmaceutical companies, governments and philanthropies. Such monopolies hinder the development of vaccines as a global common good.<sup>[15]</sup> In addition, to counteract the drivers of zoonotic spill-over and pandemic risks, there is a need to push for strong (global) regulations on the practice of intensive agribusiness and industrial farming, and on the export of harmful processed (fast) food, soda, alcohol and tobacco products.<sup>[1]</sup> This would require the health and medical community to challenge corporate interests and address the commercial determinants of health.

## IMAGINING THE LIMITS OF BIOMEDICAL ECONOMIC GROWTH

All this is not magical thinking. It has been proposed by many. It’s an antidote to the illogical myth of capitalism and endless economic growth. We can become transformative, heal our wounds, and enable societal and ecological repair. We can find a different narrative and story. For this, we need to empower our imagination beyond the rigid economic fetishism of consumerism, marketing, branding and medicalisation (also known as the securitisation of health) of societies. There are alternatives and possibilities for reciprocal learning. This is in essence an ethics of limits. Let us work within the safe space of the life essentials and needs that people require, while respecting the planetary boundaries within which life can take place.<sup>[16]</sup> Let us start a movement of ‘limitarianism’ in biomedicine, and thereby give space to health, care, and ecological wealth.<sup>[17]</sup>



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# Don't waste a pill: initiatives for sustainable medication use

## IMPACT OF MEDICATION WASTE

Medications are the most commonly used intervention in healthcare. However, at least one-third of patients end up with unused medication during their treatment, which is then discarded. This medication waste has considerable implications economically, with an annual financial loss of €100 million in the Netherlands,<sup>[1]</sup> as well as environmentally, with worldwide around 50% of patients discarding medication improperly in the toilet, drain, or garbage.<sup>[2]</sup> This contributes to the 190 tonnes of pharmaceutical residues that reach Dutch groundwater annually,<sup>[3]</sup> of which 92% is only partly degradable,<sup>[4]</sup> harming aquatic ecosystems and indirectly threatening human health via pollution of drinking water. In addition, wasted medication is produced and distributed unnecessarily which contributes significantly to carbon emission and climate change. This article focusses on how healthcare providers can prevent the waste of potentially viable medication.

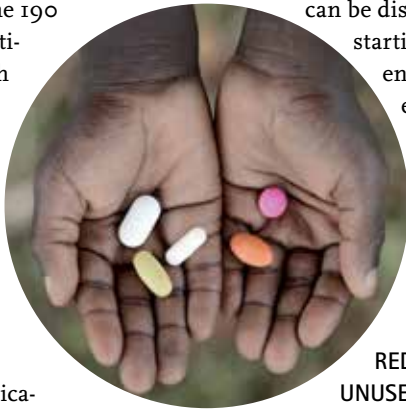
## PHARMACEUTICAL SUPPLY AND USE CHAIN

Medication waste refers to any pharmaceutical product that expires or remains unused throughout the pharmaceutical supply and use chain. Traditionally, the primary goal of this chain is to ensure timely availability of the right medication, with the right quality, for the right patient, in the right dose. Especially at the patient level, however, medication remains unused as patients may be over-supplied or discontinue treatment due to adverse events, lack of efficacy, resolution of the condition or non-adherence.<sup>[5]</sup>

Since healthcare providers guide patients' medication use, several opportunities for preventing the waste of potentially viable medication arise.<sup>[6]</sup>

## MEDICATION WASTE PREVENTION

Around 40% of medication waste is preventable, whereby dispensing medication for a longer period (>3 months) is a significant risk factor for unnecessary medication waste.<sup>[7]</sup> Thus, regulating the amount of medication that is prescribed to a patient is a potent waste-preventive strategy. Medication supplies can be restricted and tailored to individual patients, thereby preventing the dispensing of unneeded or unwanted medication. For instance, smaller quantities can be dispensed to patients



starting on therapy or in the end-of-life phase. Another example is to adjust medication refills for quantities that patients still have in stock at home in order to prevent an oversupply of medication.

## REDISPENSING UNUSED MEDICATION

If, despite preventive measures, medication waste occurs, proper disposal routes can help to mitigate downstream environmental effects. Indubitably, this includes the collection of unused medication by the pharmacy to avoid disposal via household garbage or sewage. Furthermore, redispersing unused medications returned to pharmacies has the potential to contribute to sustainable medication use. Despite public advocacy to tackle waste in healthcare, general implementation of medication redispersing is limited. This is mainly due to uncertainties regarding the quality and safety of medication that has been stored at patients' homes and falsified medications entering the supply chain, giving rise to legal limitations.

Researchers have explored most of these uncertainties and shown that these can be overcome. Firstly, patients are willing to use medication that is returned by another patient if the quality is guaranteed.<sup>[8-10]</sup> In addition, key stakeholders, including

healthcare providers, health authorities, pharmaceutical industry representatives and wholesalers are supportive of the idea.<sup>[11-12]</sup> Secondly, to assure the quality and safety of redispensed medication, sensing technologies could indicate if storage at a patient's home has been in compliance with the product label, guaranteeing the quality and safety of redispensed medication.<sup>[13]</sup>

Based on these findings, the Radboud University Medical Centre, in collaboration with Utrecht University, is currently evaluating the feasibility of a redispersing programme in routine clinical practice. In a multicentre prospective study, oral anticancer drugs that remain unused by patients are redispensed to another patient in need for the same drug.<sup>[14]</sup> In order to guarantee the quality, each drug package is dispensed in a sealed bag including a temperature measuring device. The quality of returned drugs is assessed using the following criteria: the sealed bag is unopened, the medication's outer packaging is undamaged, the remaining shelf life is  $\geq 6$  months, and the medication has been stored in compliance with the product label storage requirements.

Besides prevention of waste, medication redispersing has been suggested as a means to counter medication shortages and create a circular pharmaceutical supply and use chain. Therefore, oral anticancer drugs might be among the most eligible candidates for redispersing from a financial perspective. In addition, medication redispersing could be considered as a novel strategy to minimise the waste of all viable medication.

## CONCLUSION

Medication waste is a burden on society due to its destructive impact on the environment and healthcare budget. Strategies aimed at waste prevention and redispersing unused medication are initiatives that healthcare providers can undertake to achieve the sustainable supply and use of medication. This





requires active engagement on the part of health care providers to implement these initiatives as part of standard care.



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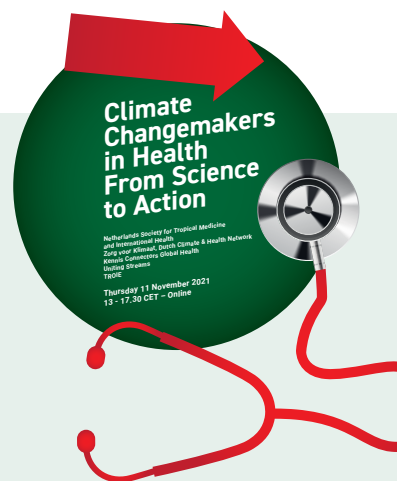
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The following two articles reflect discussions on climate action, as presented by two keynote speakers during the 2021 NVTG symposium *Climate changemakers in health: from science to action*. Links to the keynotes delivered by Renzo Guinto and Gustavo García López are available on [www.nvtg.org/wat-we-doen/symposium](http://www.nvtg.org/wat-we-doen/symposium)



## Climate change and planetary health: a view from the Philippines

At the symposium entitled *Climate changemakers in health: from science to action* organised by the Dutch Society of International Health and Tropical Medicine (NVTG) on November 11, 2021, I was privileged to listen to Dr Renzo Guinto, Chief Planetary Health Scientist of the Sunway Centre for Planetary Health in Malaysia and Inaugural Director of the Planetary and Global Health Program of the St. Luke's Medical Center College of Medicine in the Philippines. His talk was very timely, as it happened on the second week of the United Nations (UN) Climate Change Conference (also known as COP26 or the 26<sup>th</sup> Conference of Parties). As we have seen in the news, the outcomes of COP26 are still disappointing. Pledges that are made are still not sufficient to stay below the 2.0 degrees Celsius warming of the earth, let alone the 1.5 degrees. Meanwhile, for the first time though, health became a centrepiece during a COP. The discussions in Glasgow sought to reframe the climate crisis as a health crisis, a message Dr Guinto has been advocating for many years already.

### A HEALTH EQUITY ISSUE

For Dr Guinto, the latest report of the UN Intergovernmental Panel on Climate Change (IPCC), which described our current situation as a "code red for humanity", is not just a projection anymore but a reality.<sup>[1]</sup> His home country, the Philippines, is one of the countries in the world that is most vulnerable to climate change. The Philippines is witnessing the fastest rate of sea level rise in the world. It is already facing severe consequences of climate change such as typhoons, extreme drought, and intense floods. At the same time, the country had to deal with the Covid-19 pandemic, which is far from over as new variants of concern continue to emerge.

But he reminded us that climate change is also affecting not just his home country but every part of the world already.<sup>[2]</sup> It is not only an issue in the Global South anymore as we have seen during the alarming floods in the Netherlands, Belgium and Germany a few months ago. But



it is important to remember that while the whole world is affected, the health impacts of climate change are not fairly distributed. Most emission of greenhouse gasses is coming from North America, Europe and China, whereas Africa, Asia and the Pacific are suffering most from its consequences.<sup>[3,4]</sup>

#### HEALTH SYSTEMS ARE NOT READY

Dr Guinto also highlighted that the past 1.5 years have painfully shown how healthcare systems around the world are not ready to respond adequately to a pandemic. In addition, health care systems are not ready to deal with the long-term consequences of climate change. Though the Covid-19 pandemic is very worrisome, Dr Guinto sees it as a “dress rehearsal” for many climate change-related health consequences that we will be facing in the future. He called on the global health community to get their act together now and redesign healthcare systems to become resilient and prepared for a changing climate.

In his talk, Dr Guinto described contemporary healthcare systems today as operating as if the climate is stable. Though many parts of the world face climate change related problems already, most healthcare systems are still not equipped nor prepared to deal with its consequences for health. Moreover, healthcare is also a great polluter itself, contributing nearly 5% of the world's total greenhouse gas emissions. Hence, major reforms are needed in many aspects of healthcare so that it both mitigates and adapts to climate change.

Dr Guinto urged the audience to expand its vision for the future of healthcare systems in the 21<sup>st</sup> century. For him, healthcare must not only be universal, therefore leaving no-one behind, but also be of high value, making patients not just healthier but also happier. Covid-19 also is a stark reminder that health systems must also be pandemic-resilient, with the ability to detect outbreaks early, respond to them quickly, and allow for rapid recovery.

He also argued that, in the era of climate change, health care systems should also

be climate smart, a term that highlights the need to both mitigate and adapt. A climate smart health care system is, in the first place, climate-resilient and disaster-ready – which he described as a system that “bends without breaking”. A climate-resilient healthcare system is prepared for climate-related disaster risks and also monitors and responds to climate-sensitive diseases such as malaria and heat stroke. Meanwhile, the other side of the climate-smart concept is sustainability. Healthcare systems must adopt green energy, provide sustainable diets for health workers and patients alike, and purchase their supplies from manufacturers that abide by sustainability practices.

#### PLANETARY HEALTH AS A NEW PARADIGM

To facilitate the transformation of health care systems worldwide, Dr Guinto is advocating for the adoption of the ‘planetary health’ approach. “Right now, I have two patients – not only the human patient who needs care and treatment, but also patient Earth, which is suffering from human-induced ecological damage”, is how he described his planetary health mission. He called on the audience to shift away from an ‘ego-logical’ approach towards a truly eco-logical perspective. Humans cannot anymore see themselves as being at the top of the pyramid of nature, with the right to extract, consume, and pollute; instead, humanity must live in solidarity with other creatures and all of Earth's components.

Planetary health may be a relatively new concept, but Dr Guinto shared that it is rapidly gaining traction in the Philippines. During the pandemic, he and his collaborators established Planetary Health Philippines, a national community of Filipino scholars, health practitioners and planetary health advocates from diverse disciplines and backgrounds, with the aim to cultivate and advance planetary health in the country.

<sup>[5]</sup> Planetary health challenges manifest locally; therefore, communities must be mobilised to tackle problems and generate solutions on a local scale. Dr Guinto shared the network's initial efforts in

developing a policy and research agenda for planetary health in his country. He also discussed some innovations in the area of education, such as new planetary health courses offered in the undergraduate curriculum of several universities in the Philippines. In the coming years, Planetary Health Philippines also aims to involve fisherfolks, farmers and indigenous communities, as the movement for healthy people and a healthy planet goes beyond academia.

The work of Dr Guinto and Planetary Health Philippines provides a positive example not only for low- and middle-income countries, but also for high-income countries such as the Netherlands. We too have lots to learn about embracing a holistic and humble approach to healthcare and to our planet. Dr Guinto closed his keynote presentation by reminding us: “Let us do this not only for ourselves but also for the future children of the Philippines, the Netherlands, and the rest of the world.” I am in.



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Editorial note: The following article is a shortened version of an article by Gustavo García López on the subject and reflects his keynote lecture at the NVTG climate changemakers symposium (November 2021).

# What kind of climate science for what kind of action? Integrating science, community and culture for climate justice

## FROM COLONIAL-NEOLIBERAL-CORPORATE CLIMATE SCIENCE TO CLIMATE JUSTICE SCIENCE

The climate crisis poses “the greatest threat to human health in history”,<sup>[1-3]</sup> as well as to all of life on this planet. Yet, despite broad scientific consensus and public support for climate action, there has been persistent *inaction* from governments and corporations. What kind of climate science is needed to inform the needed transformation towards both climate stability and social justice?<sup>[4]</sup>

The climate crisis is the product of a social system where profit rules over the life of people and planet. This system legitimises a particular form of neoliberal climate science.<sup>[5]</sup> It is strongly *disciplinary*, giving primacy to the natural/geophysical sciences and, secondarily, to economics and law, as the ‘disciplines’ which can inform and develop solutions for decision-makers.<sup>[5,6]</sup> It builds on the idea of uninterrupted progress through knowledge accumulation (predominantly from the global North) and the control and prediction of nature and populations.

This science envisions nature and society as separate, and humanity as a homogeneous entity ushering in a new geologic era (the Anthropocene). Climate inaction is naturalised as resulting from the inherent limits of ‘human nature’ (‘psychological barriers’),<sup>[7]</sup> the economic costs of acting, or the absence of technological solutions.<sup>[8]</sup> This science prefers technocratic solutions that do not question the roots of the crisis: conservation and tree planting, education, green consumption and taxes, population reduction, and new technologies (from renewables and carbon markets to geoengineering and carbon capture).<sup>[9-11]</sup> When citizens oppose

such solutions and promote systemic changes, they are labelled as ignorant and immature ‘idealists’. Addressing the root causes of the climate crisis requires a different kind of science, which centres on climate justice through a transdisciplinary, decolonial praxis.

## A TRANSDISCIPLINARY SCIENCE WITH/FOR THE PEOPLE

Climate justice science is transdisciplinary, shifting from quantitative models to social dynamics and research-action. It embraces knowledge born out of everyday life and struggles,<sup>[12]</sup> integrating practice and critical reflection (*praxis*).<sup>[4]</sup> It is relational and the result of co-creation by community leaders, scientists, artists, and their non-human environments. It is a science with/for the people.<sup>[13]</sup> It comes through nature-cultures: music, dance, illustrations, film, oral stories, jokes, planting, harvesting, and cooking. It creates new conceptual tools such as ecological debt, environmental colonialism, climate genocide and ecocide, intersectionality, body-territories, social ecologies, environmental, water and climate justice, agroecology, and food sovereignty.<sup>[14]</sup> It recognises that information is not knowledge and knowledge is neither truth nor wisdom. It is politicised because, in matters of life over death, there is no neutrality possible.

## A DECOLONIAL SCIENCE FOR PLANETARY JUSTICE

A climate justice science puts decolonial justice at the centre of decarbonisation transitions. Contrary to the discourse of a universal humanity, this science unmask the ‘Anthro-Obscene’ of dramatic class, gender, racial and North-South inequalities at the root of the crisis.<sup>[15]</sup> Climatic heatwaves and floods are interconnected with police

violence and toxic factories, part of the system of colonialism and racial capitalism and its dramatic wealth, gender, racial, and North-South inequalities. Climate justice science shows that, for afro-indigenous populations, the apocalypse that we fear has already been here since colonisation, with enduring practices of dehumanisation intimately linked to the climate crisis. They deny the existence of different forms of knowing and being in the world; they justify the sacrifice zones of fossil fuel extraction, the walls that keep climate refugees out, and the repression of those who oppose them;<sup>[16]</sup> finally, they promote new forms of extractivism – large-scale renewable energy projects, pre-packaged ‘adaptation’ plans, and new mines for ‘green minerals’.<sup>[16-18]</sup>

Climate justice science has a role to play in acknowledging the role of science in enabling violence against colonised peoples and nature, and in identifying ways for restorative justice. This includes looking at access to scientific data and including marginalised voices, for example by establishing diverse and inclusive research teams.<sup>[6]</sup>

In addition, climate justice science reminds us that the climate cannot be described only through predictive computer models. It advances alternative future visions which embrace the inevitable collapse of the colonial-capitalist system, opening possibilities to “healthier forms of collective existence.”<sup>[19,20]</sup> Drawing on indigenous ancestral wisdoms, this science proposes that the only way to postpone the end of life on the planet is to learn to re-exist in interdependence with other humans and more-than-human nature. It accepts that not everything can be proven with facts, that we will never fully understand





the depth and richness of our world. It breaks the dichotomy between the ‘mind’ and its ‘enlightened’ rationality, and the ‘heart’ and its emotions, proposing instead a ‘thinking-feeling’ that go together with a doing. It emphasises sacred resources, culturally significant plants and animals, communal health and spiritual well-being as measures of environmental health.<sup>[4]</sup> The body and the territory are one, the human lungs are connected to the forest lungs, our mothers with mother earth, and so the health of one reflects on the other.<sup>[21]</sup>

COUNTERING COLONIAL CLIMATE SCIENCE IN PUERTO RICO: CASA PUEBLO'S SCIENCE + COMMUNITY + CULTURE

Casa Pueblo, in the mountain town of Adjuntas, Puerto Rico, a Caribbean island colony for the last 500+ years, offers an example of this climate justice science. Opposing the colonial science that has experimented in our body-territories with Agent Orange (still shamelessly celebrated by some),<sup>[22]</sup> contraception pills and transgenics, and that argued we were too small and overpopulated and lacked enough resources to be sovereign,<sup>[23]</sup> Casa Pueblo has developed a model they call “science, community and culture” to promote eco-social justice and sustainability.<sup>[24]</sup>

Science means deeply understanding a problem through transdisciplinary collaborations and citizen participation. It is not only a source of knowledge but a tool to “plant hope and cultivate dreams”<sup>[25]</sup> for a decolonial, sustainable territory: science (*ciencia*) with a conscience (*conciencia*).<sup>[26]</sup> Culture grounds scientific knowledge with other forms of knowing and feeling, local experiences and identities. Radio, music, cinema, theatre and other visual arts are means to educate, unite and forge lasting ties. The organised community is the central motor of change, participating in the co-production, dissemination, and benefits of the science. Scientific study is thus combined with a vision of deep democracy: the people decide, no to extraction, yes to water, forests, and life. Casa Pueblo's science-community-culture has crucially fought against the death projects of colonial-capitalist

extractivism. They defeated a large-scale mining project in the 1980s-1990s, opposed a methane gas pipeline in the 2010s, and instead started with a ‘people's forest’,<sup>[27]</sup> thereby challenging traditional scientific visions of forests as ecosystems without human engagement that are to be protected separately. They designed small-scale renewable energy systems for the region's households and small businesses, which allowed them to respond to the months of electric outages after hurricane Maria in 2017, providing essential services such as refrigeration of insulin and respiratory machines, and thus saving countless lives. This response was embedded in their project Adjuntas Solar, aiming to turn the entire town into a solar-energy hub as a counter to the ‘energy colonialism’ of corporations and the government, which try to perpetuate fossil fuel dependency. The engineers of the solar systems are interlinked with the small business owners, environmental justice leaders, street artists, and filmmakers - a beneficial mix of science community and culture.

CONCLUSION

Climate justice science teaches us that the praxis of creating more equitable, ecological and decolonial worlds is a learning process full of uncertainties. We must do so through relational entanglement and complicity, meaningful responsibility and accountability, embracing complexity and uncertainty, and deep humility and generosity.<sup>[19]</sup> This is the path to ‘survive, love and create’ new imaginaries and practices of hope for the future, and to seek common ground in our shared *humanity* and *planetary ecology* under a horizon of equality. May we walk this path together, and may no one be left behind.



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## Networking and sharing knowledge for health sector sustainability

Care for Climate ('Zorg voor Klimaat' in Dutch) is a working party (WP) of the Dutch Society for Tropical Medicine and International Health (NVTG). It was founded in July 2020 as a follow-up to the 'call for action' formulated at the 2019 NVTG Climate Emergency symposium. Over the past 18 months, the number of health professionals involved has grown to 42.

In its short existence, Care for Climate has already accomplished substantial results. The working party played a key role in organising the 2021 NVTG Climate Changemakers in Health symposium. Also, the WP hosted a series of five webinars – each with its own perspective on the theme of climate and health – aiming to increase awareness, exchange knowledge, and inspire health-care providers to take action at their place of work. In July this year, the WP launched two platforms – the Knowledge Platform and the Networking Platform – on its website ([www.zorgvoorklimaat.nl](http://www.zorgvoorklimaat.nl)). Climate changemakers in health are invited to register their initiatives that make the health sector more sustainable or decrease its carbon footprint. The goal is to connect, inspire and exchange ideas. In October, the Networking Platform was nominated by the Green Deal for an award for best sustainable healthcare initiative.

Tapping into knowledge from colleagues worldwide is part of Care for Climate's approach to making the Dutch health sector more sustainable. Facilitating the exchange of global health knowledge in

the Netherlands is also key to the work of Kennis Connectors Global Health (Kennis = Knowledge)(KCGH). That is why Care for Climate has teamed up with KCGH, which is supporting the webinar series and the Networking Platform.

Besides networking, linking partners, and consultancy in the Netherlands, Care for Climate works with KLIK green ([www.klik-krankenhaus.de](http://www.klik-krankenhaus.de)), a collaboration between 245 German hospitals implementing sustainability initiatives. Inspiring ideas from these German hospitals are expected to be of interest to partners in the Care for Climate Networking Platform, and are considered beneficial for the Dutch health sector. To share just one idea from Germany: one organisation's energy-efficient heating system uses the water which cools its computer servers to heat up the baths at its rehabilitation clinic.

More information is available on the website [www.zorgvoorklimaat.nl](http://www.zorgvoorklimaat.nl) (in Dutch) and social media:

[@zorgvoorklimaat](https://twitter.com/zorgvoorklimaat)

[@kennisconnectorsglobalhealth](https://twitter.com/kennisconnectorsglobalhealth)



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**KCGH:** facilitating GH knowledge transfer to the Netherlands. KCGH enables the exchange of GH knowledge in the Netherlands. As facilitators, we do not fund research or training abroad. Instead, we connect GH experts to each other and to Dutch knowledge users. KCGH also supports the process of applying the knowledge to the Dutch health system. As an additional benefit, we stimulate a more global perspective on health. KCGH was set up by the Netherlands Society for Tropical Medicine and International Health (NVTG) and the Training Institute for International Health and Tropical Medicine (OIGT). It is subsidised by the Dutch Ministry of Health, Welfare and Sport (VWS).

# The link between climate justice and public health policies

**W**hile the world struggles with the Covid-19 pandemic, the accelerating health crisis, induced by the climate emergency, requires our urgent attention. No community – much more so for a poor than a rich – is immune from the health impacts of climate change. People around the world face increasing extremes of heat, floods, food and water insecurity, as well as changing patterns of infectious and chronic diseases. Unless urgent action is taken, the health impacts of the climate emergency will bring further disruption, threaten lives and livelihoods and compromise the health systems we depend on.<sup>[1]</sup>

The Covid-19 pandemic and climate emergency represent converging crises. At the same time, climate emergency and epidemiological changes share common drivers. It is imperative that these emergencies are addressed in a comprehensive manner, while acknowledging public health needs, inequalities and historic injustices. It has now been nearly fifty years since the Club of Rome questioned the sustainability of continued economic growth within the ecological footprint.<sup>[2]</sup> Over the last decade, earth system researchers have shown that we are crossing ecological planetary boundaries, driven by biodiversity decline, climate change and nitrogen deposition. This creates all kinds of 'systemic risks', such as the acidification of the oceans, melting of permafrost and ice sheets, desertification and rising sea levels accompanied by effects such as crop failures, natural disasters, conflict and migration, extreme heat periods, and a much greater chance of pathogen cross over from animal to human because natural habitats have much less ecological variation.<sup>[3]</sup>

The ecological 'thresholds' that prevent epidemics have decreased considerably, also due to the enormous deforestation.<sup>[4]</sup> Changing patterns of plantation and farming in forest land is seen as a likely cause of the Ebola outbreak of 2014 in western Africa and the emergence of Nipah virus infections in Asia.<sup>[5-8]</sup>

Phenomena altering the human-animal-ecosystem interface lead to zoonoses with devastating consequences for humans and livestock, and this also seems to be behind the emergence of SARS-CoV-2.<sup>[9,10]</sup> Climate change and globalisation also favour the emergence and spread of arthropod-borne diseases in Europe such as West Nile fever, dengue, Zika, tick-borne encephalitis and leishmaniasis.<sup>[11,12]</sup>

**T**his is a global challenge, and the impact is being felt transnationally. This is not a 'delineated' medical record, but the link between climate change and health also shows that it is mainly the marginalised, poorer, population groups, both in the global South and in the European countries themselves, that are most affected.<sup>[13]</sup> This means that the climate change and health crisis is also a major issue of justice and global solidarity. Consequences of climate change are endured unequally and disproportionately. It is essential not only to look at biomedical, narrowly formulated, solutions and treatments, but to also consider how traditional, indigenous and community initiatives are working together to tackle the climate crisis. There is a lot of knowledge, practice, and prevention there about how humans can have their place in ecological systems in a sustainable, balanced way. That is ultimately better for public health and also the health of the planet.<sup>[14]</sup> For much too long, the global health sector has seen the climate challenge as something not on its plate. Climate change hasn't been at the core of our activities. We must recognise that if we don't transform our overheated economic system, all our health interventions could turn out in vain. The global health sector is just beginning to discuss this most urgent issue. See Text Box 1 for a snapshot of recent 'climate changemakers' in action.

## TEXT BOX 1: ACTIONS TO ADDRESS THE IMPACT OF CLIMATE CHANGE ON HEALTH

**Be-cause Health**, the Belgian platform on international health, organised its annual international conference on the question of how to approach the climate emergency in a just manner. Speakers from different continents and from different perspectives and backgrounds discussed climate justice and emerging problems on November 23 and 24, 2021. An explicit choice was made to give the floor to those groups (indigenous populations, youngsters, women, ...) that are often not really listened to at high-level international conferences. The urgency of the issue and the need for an interdisciplinary, intersectoral, intergenerational and international approach emerged in the interventions and debates. A key message that came out of the conference is that these complex health issues should be tackled within the context of international cooperation, solidarity and policy, and that attention should also be paid to regions and groups that are already experiencing a lot of stress. All presentations presented during the conference are available on the website: [www.be-causehealth.be/en/presentations-23-24-november/](http://www.be-causehealth.be/en/presentations-23-24-november/). A digital report with the recordings of the conference embedded, translated in French and English, will be available during the first part of 2022.

**Be-cause health working group on Climate Justice and Health Equity** will be established that will offer a platform for sharing and learning between Be-cause Health members, to



see how climate change impacts their health activities and programmes and to translate experiences from the field and research findings into policies and practices, linked to the Belgian Development Cooperation, in order to tackle climate change.

On 11 November 2021, the NVTG organised its annual symposium titled **NVTG Symposium Climate Changemakers in Health: From Science to Action**.

See: [www.nvtg.org/wat-we-doen/symposium](http://www.nvtg.org/wat-we-doen/symposium).

#### Care for Climate – Dutch Climate and Health Network

was established in 2020 as one of the working parties of the NVTG. The network, however, seeks alliances with other initiatives and parties in the Netherlands and beyond.

See: [www.zorgvoorklimaat.nl](http://www.zorgvoorklimaat.nl) (in Dutch).

**FESTMIH** is in the process of establishing a working group on climate change and global health justice. The working group aims to contribute to and represent opinions of members within the FESTMIH community. The strength of the network is its linkages to partners worldwide through projects and institutional training partnerships. Goals include sensitisation for behaviour change and political engagement, as well as providing a platform for exchange in order to develop feasible applications and adaptations within the health providing sector.

#### TEXT BOX 2: BE-CAUSE HEALTH AND FESTMIH

**Be-cause Health** is an informal and pluralistic platform that connects different stakeholders that are active and interested in Belgian Development Cooperation in the field of global health

(such as academics, NGOs, students, diaspora organisations, governmental bodies, and partner organisations in LMICs).

In this way, Be-cause Health unites approximately 400 people associated with some fifty organisations and institutions. The platform facilitates the sharing of experience, knowledge and expertise through working groups and seminars in order to find innovative ways of looking at complex global health challenges. Every year, Be-cause Health brings all these stakeholders together at a conference to dive deeper into one of these challenges. In 2021, the international conference topic was climate justice and health equity.

See: [www.be-causehealth.be/en/](http://www.be-causehealth.be/en/)

**FESTMIH** connects national societies and other organisations and platforms active in the domain of global health and tropical medicine. The federation is founded in 1994 in the build-up to the first European Congress on Tropical Medicine and International Health in Hamburg one year later. Its mission is to improve the health status of people worldwide by establishing partnerships and mobilising professionals and by promoting and disseminating research in global health and tropical medicine. Activities include: organisation of the European Congress on Tropical Medicine and International Health; publication of the journal *Tropical Medicine and International Health*; liaison with European schools of global health and tropical medicine; and advocacy for universal access to health and equity in health. See: [www.festmih.eu/about-festmih/](http://www.festmih.eu/about-festmih/)



Magalie Schotte (Be-cause Health), Remco van de Pas (Be-cause health/ITG Antwerpen), Charlotte Adamczick (Swiss Society), Israel Cruz (Spanish Society), Esther Jurgens (Dutch Society and FESTMIH), Françoise Gay-Andrieu (French Society), Sofie Jacobse (Care for Climate), Rosie James (Irish Platform) and Sophie Schneitler (DTG)  
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# Decision-to-delivery interval in emergency caesarean section in a district hospital in Ghana

Caesarean section (CS) is the most common surgery performed in obstetrics.<sup>[1]</sup> Even though CS can be a lifesaving procedure, it is a major surgery and is associated with maternal and neonatal risks, especially in settings that have limited resources.<sup>[1,2]</sup>

One of the most important factors in performing a CS is the indication. When an emergency CS is indicated, the Royal College of Obstetricians and Gynaecologists (RCOG) and American Academy of Pediatrics (AAP) recommend a decision-to-delivery interval (DDI) of thirty minutes or less for all emergency CSs to minimize neonatal hypoxic morbidity and mortality.<sup>[3-5]</sup> The thirty-minutes recommendation was agreed upon by a consensus of experts without any hard evidence.<sup>[6]</sup> Furthermore, due to weak health systems, limited resources and insufficient personnel in low- and middle-income countries, the DDI is often prolonged without any significant morbidities.<sup>[7,8]</sup> Recent research has shown that if the DDI crosses the 75 minutes mark instead of the 30 minutes, the risk of significant maternal and neonatal morbidities increases.<sup>[9]</sup> When evaluating the optimal DDI, it is important to consider the degree of urgency of the CS. This classification is shown in Table 1 and is used worldwide.<sup>[10]</sup> With this knowledge, the RCOG is considering adjusting the recommendation for the DDI of a category 2 CS to 75 minutes instead of 30 minutes, while taking into account the maternal and foetal condition.<sup>[11]</sup>

Several factors have been described that influence the DDI, including location of the operation theatre and obstetric unit, availability of the operation theatre

TABLE 1. Classification of urgency of caesarean section<sup>[10]</sup>

CATEGORY	DEFINITION
1. Emergency	Immediate threat to life of woman or foetus
2. Urgent	Maternal or foetal compromise but not immediately life threatening
3. Scheduled	Needing early delivery but no maternal or foetal compromise
4. Elective	At a time that suits the woman and maternity team

and team members, and the awareness of the urgency by the whole team.<sup>[6]</sup>

## CS TRENDS AND PRACTICES IN GHANA

Ghana's latest health survey has shown that 13% of live births are delivered via CS.<sup>[12]</sup> This rate varies among the different regions in Ghana.<sup>[3,12]</sup> Especially in urban areas, this rate was higher.<sup>[3,4]</sup>

In Holy Family Hospital (HFH), neonatal asphyxia after an emergency CS is one of the most common causes of neonatal morbidity and mortality. HFH is a district hospital located in Berekum, a city with 60,000 people in the western part of Ghana. Due to the lack of efficient treatment options, such as post-asphyxia neonatal cooling and a continuous positive airway pressure (CPAP) machine, the treatment of this condition in the hospital is limited. Therefore, one of the most important determinants to improve here is prevention. Research shows that DDI is one of the more essential variables in the prevention of neonatal asphyxia.<sup>[8,9]</sup> There is no data available on DDI in this particular hospital, and Ghanaian national guidelines do not refer to RCOG and AAP recommendations. The aim of this study is to determine the mean DDI and to analyse the possible reasons for delay.

## METHODS

A prospective cross-sectional study was performed over one month from 12 February 2021 to 12 March 2021

in HFH in Berekum, a general hospital with an average annual number of deliveries of around 3,500.

The hospital has an obstetric department located next to the operation theatre. During duty hours, a house officer and medical officer are responsible for the entire hospital. The operation room nurses are present at the operation theatre, and the nurse anaesthetist has to be called.

All emergency CSs with complete records were included. Emergency CSs were defined as CS after failed assisted vaginal delivery, cord prolapse, placental abruption, ante partum haemorrhage, pathological cardiotocography (CTG)/ foetal distress, breech presentation in labour with contraindication for vaginal delivery and severe pre-eclampsia. Failed induction was excluded if no foetal distress was present.

DDI was defined as the time interval between the decision to perform a CS to the time of the actual delivery of the baby. The DDI was recorded in minutes.

A questionnaire was filled in by the doctor making the decision to perform the CS. The information recorded on these forms include: indication for the CS, estimation of gestational age, the time when the doctor was informed by the midwife to evaluate the patient, time of decision for CS, the time of incision,

**TABLE 2. Emergency CS indications**

INDICATION FOR EMERGENCY CAESAREAN SECTION	
Cord prolapse	1
Abruptio	3
Failed assisted vaginal delivery	2
Pathological CTG/foetal distress	21
Breech	1
Breech of first twin	2
Uterine inertia	3
Cephalic pelvic disproportion	6
Severe preeclampsia	2

**TABLE 3. Reasons for delay in emergency CS**

REASON FOR DELAY	
Doctor was busy (>10 min)	8
Preparation and transport to operation theatre took longer (> 10min)	14
Waiting time for the anaesthetist (>10 min)	1
Anaesthesia was difficult	2
Other *	3
No delay/no reason reported	13

\* Other reasons: waiting for lab results, waiting for magnesium sulphate to be given in severe pre-eclampsia

the time of delivery and, if applicable, the reason for delay. Along with this, information on the neonate was reported as the Apgar score at one minute and five minutes, weight and sex.

After collecting the data, the indications for CS were categorised by urgency classification. Category 1 indications are cord prolapse, placental abruption and failed assisted vaginal delivery. Pathological CTG/foetal distress, breech presentation in labour and severe pre-eclampsia were classified as category 2. Category 3 included uterine inertia and cephalic pelvic disproportion.

A low Apgar score was defined as an Apgar score of 7 or lower at five minutes.

**RESULTS**

During the one-month study period, 213 live birth deliveries were performed of which 60 were CSs; 45 of these CSs were emergency CSs. That gives a

CS rate of 28% and an emergency CS rate of 75%. The questionnaires were filled out in 41 of the 45 cases. The indications for the emergency CSs are shown in Table 2. A DDI of less than 30 minutes was achieved in 17% of the cases. The mean DDI was 54 minutes.

**SUBGROUP ANALYSES**

Subgroup analyses showed six emergency CSs with a category 1 indication; the mean DDI in this group was 34 minutes. Category 2 included 28 emergency CSs, with a mean DDI of 60 minutes. The mean DDI was 53 minutes in the eight CSs in category 3. There was no difference seen in the DDI during the day and between different duty hours in the evening and night.

For cases with neonates born with a low Apgar score, the mean DDI was 95 minutes. This was seen in total in four cases, both in category 1 and 2 emergency CSs. One neonate died,

born at a gestational age of thirty weeks with a birthweight of only 1 kilogram. The mother suffered from severe pre-eclampsia. The reasons for delay are laid out in Table 3. The most common reason was a long duration in the preparation of the patient and transport to theatre.

**DISCUSSION**

The decision-to-delivery interval (DDI) in emergency caesarean sections (CSs) is considered an important determinant of perinatal outcome and has become a measure in audits of standard care.<sup>[13]</sup> This study evaluated the mean DDI in Holy Family Hospital Berekum. As is stated in the results, only 17% of the emergency CSs met the thirty-minutes rule. This is comparable to other low-resource settings.<sup>[8]</sup> However, the numbers are more promising if the research on aiming for a DDI of less than 30 minutes for category 1 and less than 75 minutes for category 2, as mentioned in the introduction, is taken into account. The results show a mean DDI in category 1 CS of 34 minutes, which nearly meets the 30-minute rule and a mean DDI of 60 minutes in category 2. However, due to the low number of cases of category 1 CSs, it is difficult to draw major conclusions here.

Preparation of the patient and transport to the operation theatre are reported as the main reasons for delay. Multiple proceedings are necessary to perform a CS, including obtaining informed consent, determining blood group and haemoglobin level, and preparing pass iv-line and urine catheter. Further research should be done to determine possible opportunities to improve this process.

The second most reported reason of delay was that the doctor was too busy; this reason was only reported during duty hours. However, this didn't result in a difference in the mean DDI. The doctor on call is responsible for the entire hospital, including a crowded emergency unit during duty hours, so constant availability cannot be guaranteed. An additional obstetric or Emergency Room doctor during duty hours is needed to assure continuous care.



Additionally, to improve the DDI, it is important that the process of emergency caesarean delivery is well known in the whole team.<sup>[6]</sup> Regular multidisciplinary team trainings and audits have been shown to be effective in reducing the DDI.<sup>[14]</sup> Regular audits are in place at HFH for the obstetric team as well as the neonatal team. However, a multidisciplinary team training specifically focusing on the process of an emergency CS is lacking. Such a training can improve the communication skills and can increase the awareness of the importance of DDI in the whole team.<sup>[14]</sup>

Prioritisation by the doctor in the urgency of different indications to do a CS should also be considered.<sup>[15]</sup> At HFH, this prioritisation is not standard and only done arbitrarily. An effective way to improve the DDI in the cases that need it the most is to use the classification of urgency in the communication to the team. This can increase team readiness and motivation and makes the communication easy and clear.<sup>[15]</sup>

A main limitation of this study was its duration, resulting in a limited sample size. Especially in the subgroup analyses, this resulted in insufficient numbers to detect significant outcomes. In addition, there might be a recall bias. The doctor who performed the CS was asked to fill out the questionnaire immediately. However, it is likely, due to busy hours, that this was not always achieved and that doctors filled out the questionnaires hours later.

## CONCLUSION

In conclusion, this study has shown that a DDI of 30 minutes was only achieved in 17% of the cases. Nonetheless, in the most urgent cases, the category 1 CS, a mean DDI of 30 minutes was nearly achieved. The preparation of the patient and transport to the operation theatre are the main reasons for delay and provide the best opportunities for improvement. Therefore, in addition to the recommendations below, we recommend conducting a larger prospective intervention study to assess (potentially) effective interventions, such as reducing the time to prepare the patient for CS and transport to the operation theatre.



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## Recommendations

Implement regular multidisciplinary team training to improve communication and awareness

Implement the use of urgency caesarean classification to improve communication

Perform a prospective intervention study to improve preparation of the patient and transport to operation theatre



# Reflections on MTb: an interview with Leon Bijlmakers

Leon Bijlmakers was editor-in-chief of MTb from 2015 until 2020. We interviewed him to honour his commitment and dedication to MTb.

Leon Bijlmakers graduated in 1983 as an agricultural engineer with an MSc in Human Nutrition from Wageningen University. Soon after, Leon and his wife Anny Peters were employed by Stichting Nederlandse Vrijwilligers (now SNV; Netherlands Development Organisation) for three years in the field of 'Soins de Santé Primaires' (primary healthcare) in Burkina Faso. Next, he worked with the World Health Organization sub-regional office in Zimbabwe as an associate professional officer, training health professionals in several countries in Southern Africa in conducting health system research. In Zimbabwe, he became involved in a research project, which eventually formed the basis for his PhD thesis on the implications of economic structural adjustment on health systems, people's health and child nutritional status. After spending two years in Hanoi, Vietnam, he worked for almost fifteen years as an international consultant on health system research and development with the ETC Foundation. Since 2012, Leon has been assistant professor at Radboud University Medical Center, where he teaches global health and undertakes research. The economics of scaling up district-level surgery for rural populations in Malawi, Zambia and Tanzania is one of the research projects he has been leading. As a member of the global health priorities research group, he supports several low- and middle-income countries in designing or revising health benefit packages.



From 2003 until 2010, he served as board member and treasurer of the NVTG, and as a member of the science committee. In 2015 he joined MTb's editorial board as chief editor. Five years later, he decided to give up that position, one year after having joined the editorial board of the European journal *Tropical Medicine & International Health (TMIH)*.

## HOW DO YOU LOOK BACK ON YOUR TIME AS CHIEF EDITOR OF MTb?

"Positive. I have really enjoyed working together in a team of people with diverse professional backgrounds and experiences. I do think that sometimes I may have taken over the writer's role, by editing a lot in some of the manuscripts that we received. Not every person we ask to contribute a piece to MTb is a skilled author. Good clinicians or practitioners do not always have good writing skills. But on the other hand, I thought it was necessary to publish attractive papers. As chief editor, I felt the responsibility to produce a journal with good quality content."

## DID YOU EXPERIENCE ANY STRUGGLES DURING YOUR TIME AS CHIEF EDITOR?

"I struggled a bit with the balance between the efforts we spent as editorial board members in compiling a fresh MTb edition every three months and the size of our journal's readership. I sometimes wondered, and I actually still do: who is actually reading the articles we publish? I know that some NVTG members were a bit apprehensive when MTb switched from Dutch to English, but it may have attracted non-Dutch speaking readers. We do not know how many."

## VERY RECOGNIZABLE. ANY ADVICE?

"A survey, like the one the board sent out



recently, may give a clearer idea of who reads MTb and what they like or dislike, assuming you get a good response. I know that some MDs International Health & Tropical Medicine are sharing MTb with colleagues at their workplaces. That is a good way to involve more people from abroad. During my time as board member of NVTG, I pleaded for broadening the society's membership to Global Health professionals other than medical doctors only, like entomologists or physiotherapists. This has also contributed to broadening the readership of MTb. Recruiting new MTb board members from different disciplines could also further expand the group of readers."

## IN OUR JOURNAL WE AIM TO COMBINE AND CONNECT THE MORE TRADITIONAL CLINICAL OR TROPICAL MEDICINE SUBJECTS WITH PUBLIC HEALTH. DO YOU THINK MTb SUCCEEDS IN THAT?

"Yes. It has always been the aim to alternate between clinical and public health topics. In my opinion, there is a good balance between both."

## WHAT IS YOUR VISION ON THE FUTURE OF MTb?

"It would be great if it continued to exist. It is mainly spread digitally, and I think few people still prefer to receive hardcopy versions. Transforming MTb into a full-fledged peer-reviewed scientific journal might be too ambitious and not realistic. It should occupy its own niche in an environment that is already inundated with scientific journals. With TMIH [ed: the orange-coloured European journal], we are also struggling a bit to maintain our market share. The world of scientific publications is quite volatile. Publishers sometimes put



high pressure on editorial boards, partly because they want to remain profitable. If *MTb* were to compete with other journals, it would need a professional publisher and a more attractive incentives structure for potential authors. I doubt we can afford that, in view of our voluntary board, despite all the enthusiasm of its members.”

**SO, WHAT'S THE ADDED VALUE OF *MTb*?**

“*MTb*'s added value may have dwindled a little over the years, also because of the open access policies which entail free and unlimited access to published articles. The “Dutch” character of *MTb* does make it quite unique. I am also much in favour of the longstanding tradition of combining every year's third edition with the annual NVTG conference theme. It provides useful information that is complementary to the conference talks and helps feed the discussions, which is good. Besides this, *MTb* remains relevant for NVTG working parties, as a platform to spread information and ideas. I also feel that, with the recently established Kennis Connectors Global Health (KCGH), there is a need for some link with *MTb* because the two have similar values and complementary aims.”

**ANYTHING ELSE YOU WANT TO SHARE ABOUT *MTb*?**

“In my opinion, there is a need for the *MTb* board to work towards decolonising global health. A bit trendy perhaps, but I do think that we sometimes receive manuscripts with a condescending tone, as if the global North has lots to offer for the global South – whatever those two concepts mean – without acknowledging that the reverse is also true. I struggle with that, and it would be good to be more alert for such sentiments.”

**WHAT ADVICE DO YOU HAVE FOR STUDENTS AND YOUNG PROFESSIONALS WORKING ABROAD IN A LOW-RESOURCE SETTING?**

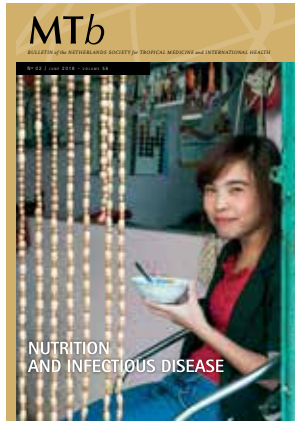
“Try to really blend in with your new environment; switch off your telephone every day for at least a couple of hours

so as not to get distracted by everything that happens back home in the Netherlands. Learn some basics of the local language, because it makes work and ordinary life so much more enjoyable for yourself. It will help you in getting connected to local people. Read the

book *De derde wereld op je cv* [ed: The third world on your cv] by Judith van de Kamp. She gives really good practical advice for when you start working in a new cultural environment.”



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