

# Cancer and contaminated food

## Toxic uncertainties in western Kenya

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Edna shows the various fruits she bought at the market, which she says give her strength. One is a green-yellow thorn melon, about the size of a mango, with spiky bits. ‘It’s good for counteracting the side effects of chemo’, she explains. The other is a tamarillo or tree tomato, deep red and orange. ‘It adds blood’.

Biddy and I are sitting on comfortable red armchairs in the small yet-to-be-painted house Edna and her husband recently built on a plot of land in Bandani, a suburb of Kisumu city in western Kenya. Edna aims to eat these fruits once a day, but at 40 shillings (c.US\$ 0.50), they are not cheap, and the family has many other expenses to meet, not least Edna’s recently completed chemotherapy. Until she took sick leave, Edna worked as a clerk for the county government. Her husband runs a welding workshop in Eldoret, a town 200 km away. After the post-election violence that engulfed the country in January 2008, the family, seeking safety, decided to move with their four children from Eldoret back to their home city of Kisumu in western Kenya.

### Making a life in Bandani

It is June 2019, and my research assistant Biddy Odindo and I had come to Bandani to discuss Edna’s treatment for breast cancer, which was partially supported by her civil service national health insurance scheme. We first met Edna back in 2014 and continued our acquaintance, most recently at the city’s fledgling cancer support group meetings. On this day, however, the story of Edna’s cancer keeps being diverted by the story of building her house and by the apparent joy she finds in finally living in her own home. It took years to build, and the family moved in just three months before our visit. ‘We have not completed – it’s still unfinished, but at least we can stay’.

Earlier that afternoon, Biddy and I had taken a crowded *matatu*, alighting at the motorway that separates the settlement of Bandani from the Hindu cemetery and the city’s golf club bordering the shores of Lake Victoria. In Bandani, the roads are unpaved, and as it was rainy season, they were full of puddles. We lost our way a few times, passing the new, gated villas of the city’s middle classes and the older houses belonging to Bandani’s poorer residents, many of them single-room huts surrounded by cleanly swept yards. Eventually, we found Edna walking with her youngest daughter to meet us. Greeting us with her usual bubbling enthusiasm, she led us to her new house, where she offered us a welcome glass of cold cola.

The modest house is roofed with sparkling new iron sheets. Although marked by wooden poles, the plot is unfenced. Building materials are expensive. Inside, the walls are not yet painted, and the concrete floor still rough, but there is electricity and a large TV. A pile of building sand outside indicates plans. The plot has yet to be connected to water – pipes are expensive too – but Edna pays a young man to deliver jerry cans of water from the municipal tap. Much remains to be done, but with two children at university and two still in school and with the extended and often unpredictable expense of Edna’s cancer treatment, these projects will have to remain on hold.

Our conversation turns from cancer to its causes and her concerns about food. Edna takes us outside to show us her fruit trees – lemon, papaya and mango – and the small garden she cultivates whenever the sun is not too hot. Here she has planted *sukuma wiki*, the popular dark green kale



RUTH PRINCE



BIDDY ODINDO

Fig. 1. Fruits which boost the immune system.

Fig. 2. House in Bandani with garden.

customarily eaten with the staple maize dish, *ugali*. ‘Our world is full of chemicals’, Edna tells us,

They can enter your body and can enter your cells and change them to cancer cells. There are so many chemicals we are using. Herbicides, chemicals, and you cannot know if they are also in the food [...] Like *sukuma wiki*. People like to spray them with herbicides, and then they harvest them immediately. They just pluck the leaves and sell them. You are supposed to wait for several days after spraying, but they don’t do that.

She, too, sometimes sprays her vegetables, but she waits for the rain to wash the chemicals away before harvesting. ‘With herbicides, you wait for four days before harvesting. You do it properly. Also, if it rains heavily, the chemicals will be washed out of the plant, washed away’. The garden is small, and like most urban residents, Edna buys most of her vegetables and food from women at the market. Here, it is difficult to tell whether chemicals have been used.

In Kenya, you cannot know. You cannot taste [the chemicals] [...] You cannot trust someone if she tells you there are no pesticides. People put them. And there is no way you can tell.

I ask what one can do about this:

With *sukuma wiki*, if you buy it, you can just boil the leaves in a lot of water, just boil for a long time, then ... that chemical boils away.

I heard this advice from other women, too, worried about their children ingesting chemicals in and on vegetables and fruit. Through WhatsApp and Facebook, those with smartphones, including members of the cancer support group, share links to circulating stories, news and popular advice about what substances could be toxic and how to avoid exposure.

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1. I began research on cancer in 2014, together with Bidy Odindo, focusing on access, treatment, kinship and care. Research conducted in 2018 and 2019 was funded by a Horizon 2020 European Research Council Starting Grant, no. 759820.

2. In Kenya, misdiagnosis, multimorbidity and uneven access to treatment further complicate cancer's visibility and appearance as a chronic disease (Mulemi 2015; Prince 2021). Signe Mikkelsen is conducting research on concerns about toxic foods in Tanzania for her PhD at the University of Oslo.

3. One report claims that *mugongowazi* are sold on to the Democratic Republic of the Congo and Sudan. See Wambai (2009).

4. The Covid-19 pandemic led to a drop in fish imports from China. Although the market in local fish is now thriving, many have lost their livelihoods. See *Business Daily* (2021).

5. The Stockholm Convention banned mirex and endosulfan in 2004 and 2012 respectively.

6. Kibos Sugar factory to close down over pollution. *KTN News*, 9 March 2020. <https://www.youtube.com/watch?v=52wifFab3os>; Cane farmers fault NEMA for closing Kibos Sugar factory', *NTV News*, 11 March 2020. <https://www.youtube.com/watch?v=WBdgcXM9gtw>.

7. Estimates are available at the Global Cancer Observatory, sourced from the Nairobi and Eldoret Cancer Registries. <https://gco.iarc.fr/today/data/factsheets/populations/404-kenya-fact-sheets.pdf> (accessed 18 February 2021).

8. I am grateful to the reviewers for pointing this out.  
9. Thanks to Noemi Tousignant for helping me to clarify this point.

10. Thanks to Sandra Calkins for pointing this out.

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*Business Daily* 2021. Kenya fish imports from China plunge, market prices rise. 26 April. <https://www.businessdailyafrica.com/bd/economy/kenya-fish-china-plunge-market-prices-rise-3376480>.

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Meanwhile, Kenyan newspapers regularly report on cancer, often highlighting the importance of diet for healthy living, boosting immunity and dealing with the side effects of cancer treatment. In addition, church communities, notably the Seventh-day Adventists, issue booklets about diet, advising people to avoid *sukuma wiki* and instead eat 'indigenous' or 'local' vegetables that they claim are not sprayed with chemicals as they grow wild. None of this offers certainty, though, nor a protective body of knowledge on which to rely.

During my fieldwork on cancer in Kisumu,<sup>1</sup> I gradually began, like those around me, to ask questions about its location and its temporalities, its beginnings and endings. Cancer's entanglements with toxicants and their circulation complicate such questions in Kenya, as elsewhere (see Jain 2013).<sup>2</sup> Here I describe the 'landscapes of exposure' (Mitman et al. 2004) that Kenyans associate with an increasingly visible cancer epidemic, including particular concerns based on partial and tentative knowledge about the toxicity of foods. This starts from conversations about cancer, home, food and toxicity, moving towards livelihoods, economies and ecologies, and the food and agricultural systems in which these exposures and uncertainties are embedded.

### The fish factory

We leave Edna's house in the evening, joining the flow of pedestrians to the market at the motorway junction. Our shoes are soon caked with mud. Billowing black smoke covers the intersection – a *juakali* (informal) workshop is burning something plastic, or perhaps it is rubber. The smell is horrible. I try to cover my nose and mouth, thinking how much more protected we would be inside a taxi. Edna leads us expertly across the motorway and into the quiet side street she often uses when walking into town. She and her younger daughter have insisted on accompanying us at least part of the way: 'Exercise is good, it stimulates the immune system, it suppresses the cancer cells'. Trees line this road, reminding me of the flame trees planted during colonial times that used to grace this area with their bright orange flowers until the motorway was built. Soon the trees give way to high concrete walls as we reach the old industrial area. Next, we pass the sewage works, set behind large, electrified fences, and then the closed 'Victoria Delight' fish factory, which packaged Nile perch for export markets.

Kisumu lies on Lake Victoria, and fishing remains an essential local livelihood. Edna recalls how busy this road used to be at this time of day. Market women would wait at the factory gates to buy the fish remains, the 'bare bones', called *mugongowazi* (a Swahili term referring to 'a bare back' or 'back cut open', indicating the backbones left after filleting a fish). 'People liked *mugongowazi*', says Bidy, somewhat wistfully, 'to make soup. You can taste the fish. It's as if you are eating fish!' I ask her to explain. 'Fish is so expensive, you forget how to eat it, but at least with the bones, you make soup, and you have that taste of fish in your mouth. Those bones are so tasty!' The fish factory closed in 2016, following drastic declines in the lake's fishing yields and the women had to find other livelihoods (Ogotu 2016). *Mugongowazi* is known as poor persons' food. Given the enormous increases in the price of fish, it is all most can afford. Yet even *mugongowazi* are becoming unaffordable to locals, as they are sold on to markets elsewhere.<sup>3</sup>

I wonder if the fish factory's fate was due to competition from cheap imports. In Kisumu's supermarkets and street markets and the roadside settlements throughout the region, you could – at least before the coronavirus – buy tilapia imported from China. Indeed, Kenya had become a major importer of Chinese fish, mainly frozen tilapia and

mackerel. The tilapia looks and tastes like Lake Victoria tilapia, the local favourite, but (in early 2020) it was much cheaper (US\$ 1.5 compared to \$ 5 per kg now).<sup>4</sup>

I ask Bidy and Edna about the Chinese fish. 'It's being imported because it's cheaper', they tell me, 'but people don't trust it'. Bidy explains that in China, 'they use fish ponds to grow the fish and the food they are giving the fish, it's not even natural, it's not the natural food that they get in the lake here'. Edna maintains that she can taste the difference between Chinese and local tilapia: 'The Chinese fish is not so fresh – it's been frozen – and they also feed it this artificial food'.

Bidy disagrees: 'Now you don't even know if the fish, even tilapia, comes from China or from here', and continues, 'I don't eat fish these days because I don't know where it comes from. You cannot tell. If you buy fish in [a rural district bordering the lake], it is okay [because the fish comes directly from the lake]. But in town, you just don't know. They could be selling it as local fish, and it's from China'. She tells me:

We call that [Chinese fish] plastic fish, and it is being fed on plastic rice. It's full of, what, antibiotics, we hear, plastics, chemicals...

We laugh at the notion of plastic fish, but Bidy and Edna are serious. The concept of plastic fish suggests uncertainty about what is real and what is fake, what is genuinely healthy and what may be toxic (see Crăciun 2012). Moreover, it is not only commodities (such as fish or medicines) that are suspect; it is the people and institutions selling them (Kingori & Gerrets 2019). This pervasive sense of mistrust emerges in our conversation, as it ranges from how one fries fish and how it tastes to the oil used in frying it, where the fat comes from and how hard it is to know what is in food because women who sell the food need to eke out a living. Bidy says:

Even with oil, and this fish. People are saying that women selling fried fish are reusing the oil, again and again. They are frying the fish in the same fat! And people are adding the oil used to make electricity, from these [electric] generators – you can find oil there – so the women are adding that!

Edna adds: 'Me, I just buy fresh fish and use my own oil for frying. Then I know what oil I use and that the fish is fresh. They say that if you are not a regular customer, the women frying fish will even sell you a fried fish which is a week old, which has been refried'. She repeats something she said earlier in the afternoon: 'In Kenya, you can't know, you cannot tell'.

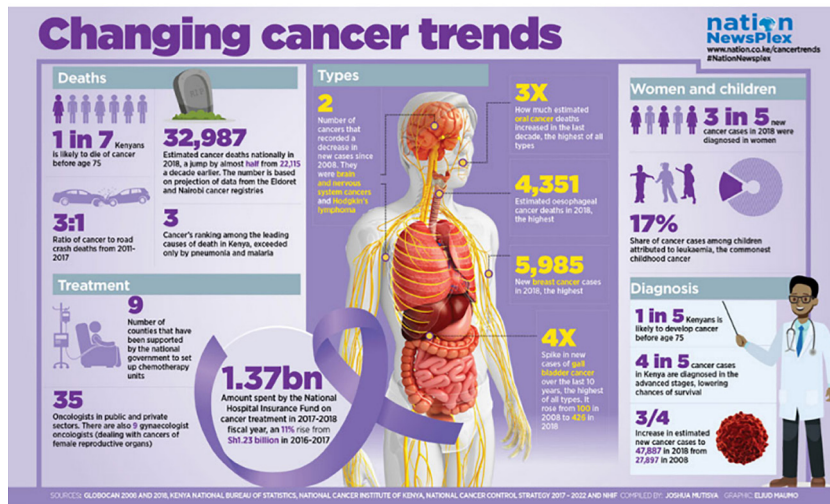
We are nearing the junction that meets the busy main road running into town. It is getting dark, and we press Edna and her daughter to turn back. Edna acquiesces but insists on first finding us a *tuk-tuk* (auto rickshaw) at the junction ahead. Unfortunately, the *tuk-tuk* driver is young and reckless. Driving like a madman, he weaves his fragile three-wheeler too close to the fume-belching lorries. So, we bang on the roof and insist on being dropped as soon as he finds a safe spot. He leaves us with an angry expression – unusual here, as people are rarely rude to each other. Still, the city is exerting pressure these days, especially on young men struggling to eke out a living.

Arriving at the house I share with my family in the former whites-only area of colonial Kisumu, I fill a glass of mineral water from our bottled supply and reflect on the differential distribution of protection and risks of exposure in the city. Later that evening, I ask my friend Philly about generator oil. 'Yes, the oil they use for electric generators, I've heard that women are frying the fish with that...'

### 'This is where cancer is coming from'

Some months later, in February 2020, along with other residents of Kisumu, we noticed a stench rising from the lake. For many years, water hyacinth has partially cov-

# New cancer cases almost doubled in a decade as deadly illness takes heavy toll



**Fig. 3.** Locally grown vegetables at Kisumu market.  
**Fig. 4.** Frying fishbones.  
**Fig. 5.** Kisumu fish market.  
**Fig. 6.** Documentary on Kenyan NTV on toxicity around Lake Victoria.  
**Fig. 7.** An illustration of the increased incidence of cancer in Kenya, Daily Nation, 2019.

ered Kisumu Bay. At times, algae blooms make the bright water green in places. Later in February, journalists from the Nation Media Group accused the Kisumu Water and Sanitation Company (Kiwasco), which runs the Kisat treatment plant off the highway near Bandani, of polluting the lake (Wafula 2020b). They claimed that Kiwasco, which still uses infrastructure built by the colonial government in the 1950s, ‘lacks capacity’ to clean the toxic waste it receives daily (from raw sewage and the industries surrounding the bay) before releasing effluent into rivers and the lake. The journalists’ report referred to a 2019 study by University of Nairobi toxicologists, who took 52 samples from lakes, rivers, soil sediment and fish in 28 sites around Lake Victoria in Kenya and Uganda and analyzed them for heavy metals, pesticides and bacteria (see Wafula 2020a).

In an article in the *Daily Nation*, journalist Paul Wafula (2020b) argued that:

Kiwasco is pumping at least seven dangerous chemicals into the lake, chemicals that cause all manner of diseases from cancer to the damage of respiratory systems. This may partly explain why respiratory diseases have overtaken malaria as the deadliest disease in Nyanza. There are also far too many people battling diseases like cancer. Ironically the same company is harvesting water from the same lake, not too far away from where it releases its waste. This is the water it cleans and distributes to hundreds of thousands of residents in the region, a double tragedy.

The study showed high levels of heavy metals cadmium, chromium, lead and mercury in some sites. Twenty-one pesticides were detected, including DDT, mirex and endosulfan, known endocrine disruptors, bioaccumulators and possible carcinogens.<sup>5</sup> Other pesticides detected included fenitrothion, chlorfenvinphos, bifenthrin and oxyfluorfen. The scientists also reported high levels of *E. coli* and other microbes.

In a two-part NTV documentary on Kenyan TV (*Toxic flow* 2020), the lead scientist, Professor James Mbaria, stated:

There was no place [in the 28 sampled sites] where we found no toxicant. All sites have at least one toxicant. The lake contains chemicals and bacteria, and other disease-causing organisms, which is of concern, considering the high increase in incidence of many diseases. Cancer today has become a very serious problem. People don’t know where it is coming from, but I, as a toxicologist, I can say without a doubt that some of these chemicals are responsible for increasing those diseases.

The NTV documentary pointed to industrial and chemical plants, mining and fishing activities polluting the lake. It also highlighted growing local concerns and environ-



BIDDY ODINDO



BIDDY ODINDO



BIDDY ODINDO



NTV, KENYA

mental activism. For example, in 2019, local activists filed a suit against Kibos Sugar & Allied Industries Limited for polluting the River Kibos, upstream of Kisumu, breaking environmental regulations.<sup>6</sup> Activist Benson Ambuti Atega explained why he decided to take legal action:

This is a matter of life and death. If we cannot protect our environment, we don’t have future generations. And this is where cancer is coming from. Think of how people are seeing this thing. Cancer is all over. People are dying because of cancer. The cause is this pollution [...] We are not against any investment in our community, we are happy with investment, but they have to follow the right procedure.

**Fig. 8.** Freshly caught tilapia from Lake Victoria.



BIDDY ODINDO

The NTV documentary suggested that the high levels of toxicants found in the lake may be one explanation for the drastic decline in Lake Victoria's fish stocks during the past 10 years, along with overfishing and the blooming water hyacinth. Stocks of Nile perch, introduced in the 1950s to stimulate the fishing industry, reduced from a high of 340,000 tonnes in 1990 to 180,000 in 2019 (the Nile perch itself led to the disappearance of the native fish it preyed upon). Interviewed in the 2020 documentary, George Mikayo, owner of Mingingo Industries (which sells farmed and imported fish), explained:

In 1999, there were nine fish factories in Kisumu and around Lake Victoria in Kenya, processing Nile perch, exported to Europe. Now, there is only one factory that is operating. Why? There is no fish!

Kenya now imports fish from China through the port of Mombasa. Two companies in western Kenya process and sell the cheaper Chinese fish to local and regional markets, sometimes along with locally farmed fish.

The University of Nairobi took samples of both lake-caught fish and frozen fish from China. Both showed high levels of heavy metals and pesticides. The scientists and journalists were keen to point out connections between toxins and disease, including rising cases of chronic disease in the region. Dr Nduhiu Gitahi, a microbiologist, explained:

If you would do a survey of the disease or conditions that people are experiencing in [the] region [around Lake Victoria], definitely you will find that effects must have been taking place, and maybe there is no one to tell them that, this, what you are experiencing, is what you are exposing yourself to [...] Those are toxicants.

Such statements from scientists, activists and journalists reflect concerns nagging many Kenyans today, who observe an 'epidemic of cancer'. Many know someone with cancer, and many families, like Edna's, struggle with its impact (Mulemi 2015; Prince 2021). Knowledge about incidence is incomplete, however. Kenya has no national cancer registry, although there are plans to establish one.<sup>7</sup> Figures are high, but is this due to improved detection or diagnosis or do they indicate rising cases? And what is causing the disease?

Aetiologies of cancer and other chronic diseases can be located outside the individual body in food systems, industrial and chemical exposures (Jain 2013; Langston 2010). Despite this, it is hard to establish causal connections, which underlines the 'slow violence' of chemicals and the colonial legacies and late-capitalist toxicities in which they are embedded (Nixon 2011).<sup>8</sup> Some cancers in west Kenya are tied to the HIV/AIDS epidemic (prevalence remains high in this region) and associated immune suppression. Scientific studies from elsewhere have established links between cancer and exposure to chemicals,

pesticides and insecticides like DDT (extensively used in this area by colonial and post-colonial governments) (e.g. Murphy et al. 2021). Many of these chemicals persist in soil long after their use.

Meanwhile, pesticides banned by the European Union (EU) continue to be marketed in Kenya (Nasike & Chesang 2021; Waltz 2020). As a result, people like Edna and Biddy question the safety of the food they eat, and wonder what is in the vegetables, maize, milk and in the fish and the oil. Often people conclude with a variation of Edna's sentiment: 'In Kenya, you cannot know. You cannot tell'.

### Uncertain terrains and partial knowledge

Anthropologists regularly discover toxicity in the places they visit in the course of fieldwork. We are acutely aware of the risks to health. Although most of us are not equipped to establish difficult-to-pin-down causes for locally prevalent diseases, our task can shift to what Kate Brown (2020) terms 'curation'; namely, following our interlocutors in tracing links and connections (Ford 2019; Moran-Thomas 2019).

The transects above convey terrains across a city of vulnerability and vitality, danger and safety, where exposures and protections are embedded in relations often imbued with mistrust. Locations such as the lake, fish markets, roadside vegetable stalls, gardens, cooking pots and family meals become saturated with a sense of uncertainty and suspicion surrounding potential toxicity and health. Here, alongside routine social and economic activities (harvesting, cooking, frying, eating, buying and selling) we also find partial and uncertain forms of knowledge – about how to live with or avoid threats to health and well-being – being tried out, sensed, narrated, debated and exchanged.<sup>9</sup>

Through such transects we can study how, for example, the locations and temporalities of cancer unfold within lifetimes, embodied and absorbed environments and their chemical geographies. While pulling away from the individual body in the story of Edna's cancer, she points me towards the focus of her life: her family and their home. Edna's cancer developed alongside her plans and aspirations for 'growth' or 'development' (*maendeleo* in Kiswahili; *dongruok* in Dholuo). At times, the disease took over, disabling and disrupting other activities, but at other times, it ebbed, allowing Edna to focus on her family's future.

It is not only Edna who struggles to embed her life and her family in a trajectory of 'growth'. Everyone is trying to develop – those spraying chemicals on their crops before harvesting, the women reusing oil to make an income, the fish traders selling Chinese tilapia.<sup>10</sup> Meanwhile, the Kenyan government continues to pursue attractive trade deals and investments that may severely impact local lives. Uncertain exposures are embedded in these livelihoods, diets, economies and ecologies, as well as in institutional capacities and the lack thereof (Tousignant 2018). Such concerns, and the aspirations for growth and development they are embedded in, are by no means confined to Kenya (Livingston 2019). Moreover, we all face the uncertainties of toxic exposures. However, toxic uncertainties and distributions take particular shape here, embedded in colonial legacies and the trajectories and inequalities of post-colonial development, and amplified within particular livelihoods and lives (Murphy 2017).

These transects, observations and conversations resist a plot line. Rather than cohere around a neat analysis, they remain nebulous and incoherent. Cancer, too, is amorphous in its location, its aetiologies and its effects across cells, bodies and families. Cancer and its relations to toxicity are emerging as something known and unknown, embedded in terrains of uncertainty – institutional, scientific, epistemic, everyday and embodied. ●

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