Hunting for carcinogens at work

In a hospital in the south of France, one oncologist has managed to mobilise his entire department and others around a project to support patients suffering from work-related cancers. By tracking their occupational exposure to carcinogens, the project helps them to get their illness recognised as an occupational illness and raises the profile of a risk that is often under-estimated in a region of France that is one of biggest users of pesticides.

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ETUI
Here in the department of Vaucluse, orchards extend as far as the eye can see into the distance that separates the villages of Le Thor and Caumont-sur-Durance. Avignon stands some 20 or so miles to the east. This fertile plain is one of the major fruit-growing areas of France, especially noted for its apples. At the end of August, seasonal workers can be seen packing cardboard crates with gleaming Granny Smiths that have just been picked.

Marc Maillan now observes the goings-on in the warehouses adjoining the imposing house he shares with his partner, Geneviève, with some detachment. The farmer handed over the business to his nephew a few years ago. From the age of 17 to 71, this great man’s daily life was devoted to growing apples, pears and, to a lesser extent, plums.

A family tragedy was to shape his destiny. While still a student at the local agricultural high school, his father suffered an accident while repairing a tractor and died. Along with his sister, he thus inherited a small plot of some 20 hectares.

This region is one of France’s most significant orchards, and most farms remain small-scale operations having, at least to some degree, avoided the stranglehold of the large agroindustrial groups. Not the stranglehold of the agrochemical industry, though, which has deep roots and a long history in the region.

“My grandfather would use lead arsenate to treat the trees,” recalls the retired arboriculturist. “Those products have always formed part of our daily life. During the mid-1980s, the large commercial companies that used to come regularly to visit us, Bayer and DuPont, began to advise us to wear masks and suits, and they encouraged us to invest in tractors with a cabin. Then some time later, the extremely volatile powders that we had to mix with water were gradually replaced with liquid products. We weren’t particularly concerned by any of this, however.”

And yet the septuagenarian clearly recalls the yellow and white oils that he used over long periods of time. He recollects his dog, who would follow the tractor as it was spreading the products, covered in a yellow film that would impregnate his coat for two months. He still smiles, although the general feeling is no longer light-hearted.

Farmer chemists

In 2015, after he had been feeling intensely tired for several months and had suffered severe weight loss – nearly 20 kilos in just a year – the axe fell: Vazquez disease. This is a myeloproliferative disorder, a malfunctioning of the bone marrow that disrupts the mechanisms for producing blood cells. “His platelet count had already fallen to 58,000, when previously it was over a million,” explains Geneviève, as she and her partner flick through the treatment guides that the pesticide companies send each year.

The 1998 “vintage” is a challenging manual for any budding chemist: DNOC or 4,6-dinitro-ortho-cresol (the active ingredient in yellow oils, banned in the European Union since 1999 due to its extreme toxicity); parathion (potentially carcinogenic to humans, according to the World Health Organisation); endosulfan (a reprotoxin) and so on. The guide recommends a total of 20 applica-
tions on apple trees between 10 March and mid-September each year. Not to mention the treatments recommended for pear, plum and other fruit trees. Marc Maillan’s occupation-
al disease file contains no fewer than 29 references to phytosanitary products, some of which, used in the 1970s and 1980s before being banned, have since been the subject of a great deal of discussion. These include the famous DDT, used to eliminate mosquitoes in countries affected by malaria; chlordecone, which is behind the spectacular rise in prostate cancer in the French West Indies, where it was spread generously over banana plantations; and even lindane, which is associated with an increased risk of non-Hodgkin’s lymphoma, a cancer of the lymphatic system.

Until his diagnosis, the impact of these products on the arboriculturist’s health had never been discussed by the family, although Geneviève admits that it did not come as a complete surprise to her. “I suspected they weren’t harmless. I even argued with him when he forgot to wear his mask when spreading.” “How can you wear a mask in that heat”, retorts the farmer. The discussion turns to the effectiveness of the individual protection equipment, particularly the suits. “If protective equipment is not used correctly, particularly the suits, then the contamination is worse than when there’s no protection at all,” interjects Églantine Armand1.

The couple listen to Églantine attentively, with deep respect. Mr and Mrs Maillan believe that it was in no small part down to her that the arboriculturist’s illness was recognised by the Agricultural Social Mutual Fund (MSA) after less than a year of trying, which is very fast compared to most cases. “Your illness was listed on the Agricultural System table, Table No 19 more specifically,” replies the social assistant from the Avignon Hospital Centre.

Despite her modesty, Églantine plays a pivotal role between doctors and paramedics, various experts (toxicologists, sociologists, etc.), insurance funds and patients involved in Giscop 84, Giscop stands for “Scientific interest group on cancers of occupational origin” and the 84 refers to the number given to the Vaucluse department. This project, which has been running since June 2017, takes its direct inspiration from Giscop 93, an initiative in place for around 10 years in

An activity that creates links

“Patients are generally delighted by this approach as they no longer feel alone. They form a relationship in which they share elements of their private life with us. For some, the fact of knowing why they have this illness enables them to accept it, perhaps not better but differently. This new activity has created different links within the department as it offers us new opportunities and enables us to work with our social assistants on issues that we wouldn’t normally examine. We move away from the framework of the hospitalised patient and into their private life a little. This project has also allowed us to create links with health insurance funds and even lawyers in legal firms, and with different partners that we didn’t know, like those involved in Giscop 93 in Paris and other local actors.”

Conversation with Christelle Besse, health executive in the Avignon Hospital Centre’s oncology/haematology department.

“...The survey enabled them to talk about something other than their illness.”

(Rémy Ponge, sociologist)

1. The reference value for platelets is generally between 150,000 and 300,000/mm³

2. Read in this regard the works by Alain Gargou (University of Bordeaux and INSERM) and Brahim Mohammed-Ibrahim (occupational physician)
a north-eastern suburb of Paris. The recent transfer of the Parisian project to the south of France is the result of a slow process that started at the end of the 2000s in an oncology/hematology department in the Henri Duffaut Hospital in Avignon.

"We had been thinking about it in the department for 10 years when we started to note a convergence of two elements: on the one hand, increased ‘recruitment’ of patients and, on the other, an observation – shared with anatomical pathologists and biologists – that we were facing ever more complex cases and more developed diseases. It was on the basis of these observations that we realised we had to research other exogenous factors," explains departmental head Dr Bohane Slama.

The slender 40-year-old is the lynchpin of the project. His interest in the occupational causes of illness date back a long time. He has been collecting data on where patients work and live since 2008. "But the mere feeling that there is a problem is not enough, hence the need to design a scientific mechanism," states the oncologist from his modest office in Avignon Hospital Centre.

**An extended survey of where people live and work**

With the help of labour sociologists, the "Giscop" approach consists of piecing together the professional background of patients diagnosed with non-Hodgkin’s lymphoma in the most detailed and exhaustive way possible. In addition to this professional component, and unlike Giscop 93, the survey also comprises a "residential" component, enabling information to be collected on the successive homes occupied by the patient, particularly on whether they are close to different industries, nuclear facilities, treated farmland, etc.

Despite the shock of the diagnosis, the vast majority of patients agree to participate in the survey. "They are generally keen to obtain information and to provide feedback on a possible link between their professional activity and their illness. At the same time, however, they have a strong attachment to a career that has enabled them to build an identity and ensure their financial security, and this can complicate matters when it comes to admitting that they have been exposed to harmful products," notes Rémy Ponge, one of the three sociologists involved in the project. "The survey enables them to talk about other things apart from their illness," he adds, to explain the patients’ strong take-up of the approach.

An anonymised report is sent by the researcher to a team of experts drawn from

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**Recognising multiple exposure**

The case of Marc Maillan is not really typical of the cases examined by Giscop 84. The quick recognition of the arboriculturist’s occupational disease and his speedy compensation are mainly due to the facts that his type of cancer is listed in one of the tables of occupational diseases in agriculture, that his disease developed while he was still working and that he was exposed to pesticides throughout his career.

Other agricultural workers monitored by Giscop 84 have seen their claims dismissed because too much time has passed between their stopping work and their diagnosis. In the case of non-Hodgkin’s lymphoma, the diagnosis must be made within a period of 10 years between the end of the work exposing the person to pesticides and the reporting of the disease. However, this principle does not take account of the particular nature of the agricultural environment. “It is very common for a farmer to continue to be exposed after retirement because he keeps lending a hand to his successors”, explains Moritz Hunsmann, a CNRS researcher and coordinator of the Giscop 84 project. The farmer must also prove that he was exposed for at least 10 years.

While it was perhaps to be expected that traditional farmers would be over-represented, the Giscop 84 researchers are discovering highly fragmented career paths. "They may have started out in agriculture, but then switched to the construction industry, followed by the agri-food industry. These people have been exposed to a huge variety of carcinogens over a succession of different work periods, sometimes including illegal work," says Moritz Hunsmann. Exposure to carcinogens as a result of handling cleaning and maintenance products is another “black hole” that makes it particularly difficult to shed light on and, even more so, obtain recognition for carcinogen exposures.

The researcher considers that the French table system, which is the result of a “socioeconomic compromise”, does not take sufficient account of the multiple exposure to carcinogens. This system facilitates the recognition of some specific work-related cancers by reversing the burden of proof: the worker does not have to demonstrate that his disease results from his exposure to carcinogens at work. This is the case, for example, for workers suffering from mesothelioma, an asbestos-related cancer.

However, it now seems clear that this “table system” relies on an obsolete monocular scheme, i.e. the idea that behind an occupational cancer lies one single carcinogen. And yet, surveys – including the preliminary data delivered by Giscop 84 – have shown that a significant proportion of workers confronted with carcinogenic risks at the workplace are exposed to multiple carcinogens, in particular those whose career path has been characterised by structural precariousness (i.e. multiple temporary contracts in various sectors).
"I wanted someone to recognise that my father's health has been ruined by work"

Testing

The sometimes firm and sometimes quavering voice of Samira Belkhadir reveals the range of emotions that have filled her life since her father's diagnosis with a blood disorder. Despite her exhausting two-year battle on behalf of this 70-year-old man, who is now very weak, the young woman from Marseille finally seems to be at ease.

“My father wanted to give up from the start. He said to me: I am tired, I am ill, I just don’t have the strength”, remembers Samira when she retraces all the steps taken between diagnosis and compensation of her father’s occupational cancer. “If you had not been there, I would never have done it”, he often says to me. “In all honesty, the compensation that my father received was not what it was all about. What we wanted was recognition of his status as a victim. I, and he too, really wanted someone to recognise that my father’s health has been ruined by work.”

Bouchaib Belkhadir worked for 25 years in an agricultural cooperative in L’Isle-sur-Sorgue, where he had several roles: initially he carried out handling work, but then, after gaining his HGV licence, he would deliver the fruit and vegetables grown on the highly fertile plain of the Sorgues. These tasks brought him into contact with numerous pesticides and other toxic products. “He used to immerse crates of apples in preservatives and then put them in a refrigerator, inside which a gas was sprayed over the stored fruit. The door of this refrigerator had a sticker with a skull logo on it”, recalls Samira. Before becoming employed in agriculture, Mr Belkhadir had, in the early years following his departure from Morocco for France at the age of 20, carried out gardening work for private customers, interspersed with apple- and cherry-picking. He also worked on a farm where he would plough the land, and sow and treat the plants.

“When he got the recorded delivery letter in January, I cried. I could finally say to him: Dad, you fell ill because you worked so much in your life”, the 30-year-old remembers, still highly upset. They are put in contact with our team of psychologists,” says Églantine Armand.

"After maybe 60 years of married life, wives sometimes lose their husbands in just a few months. In these cases, the procedure for recognising an occupational disease extends the relationship."

(Églantine Armand, social assistant)

different disciplines (toxicology, occupational medicine, sociology, biology, etc.), whose job is to identify exposure to carcinogens. Their opinion confirms or rejects the hypothesis of a probable link to work, and if in the affirmative, encourages the patient’s doctor to issue an initial medical certificate, an essential document in launching the procedure to have the illness declared an occupational disease.

The decision to limit the study to malignant non-Hodgkin’s lymphoma was a pragmatic one: it is the haematological cancer that has shown the clearest increase in the department over the last decade and it is included on one of the tables of occupational diseases in farming, an important sector for the Vaucluse economy. Moreover, there are not enough financial and human resources for the moment to extend the mechanism to other cancers. Still searching for further funding, the doctor and his team hope to include other haematological cancers (multiple myeloma, leukaemia, myeloproliferative disorder) by 2019, and yet more in the longer term.

Patients affected by forms of cancer other than non-Hodgkin’s lymphoma are directed to a surgery run by two occupational doctors. This may also culminate in a procedure for declaring an occupational disease, as was the case for Marc Maillan.

If a patient takes this path, they can rely on two social assistants – Églantine Armand and her young colleague, Héloïse Gilbert – to help them to fill out the multiple forms required, establish communication with the relevant departments in the health insurance funds, and even support them in legal proceedings, if their request for compensation is rejected.

The financial aspect is not generally the decisive element for victims and their families, however. “After perhaps 60 years of married life, wives sometimes lose their husbands in just a few months. In these cases, the procedure for recognising an occupational disease extends the relationship and, for some, becomes more even more impor recognising an occupational disease extends the relationships and for some chbso included in thingnportant than anything else. They are still highly upset. They are put in contact with our team of psychologists,” says Églantine Armand.

As the social assistant and Mr and Mrs Maillan exchange a few words under the immense branches of the plane tree that shelters the Provençal house from the sun, and with a light rain refreshing the atmosphere, the forklift truck driven by Mr Maillan’s nephew continues to pile crates of apples onto a lorry. An increasing proportion of production is now grown organically. While pesticides have not disappeared completely from the farm, they are used far more sparingly. Times are changing, even on the land.●