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Is antibiotic resistance in New Caledonia controlled by public health policies?

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LIST OF ACRONYMS

GC: 3rd generation cephalosporins

ANSM: National Agency for the Safety of Medicines and Health Products

ATC: Anatomical Therapeutic Chemical (Classification)

ESBL: Extended-spectrum beta-lactamase

Box HN: Bacteria resistant to penicillins, cephalosporins, and carbapenems

CClin-Est: Coordination Center for the Fight against Nosocomial Infections

CHT: Territorial Hospital Center

DASS-NC: Department of Health and Social Affairs of New Caledonia

DDD: Defined Daily Dose

DOM: Overseas Department

E.coli: *Escherichia coli*

E.coli: *Enterococcus cloacae*

EHPAD: Accommodation establishment for dependent elderly people

EPC: Carbapenemase-producing Enterobacteriaceae

ERG: Enterococcus resistant to glycopeptides

STI: Sexually Transmitted Infections

HD: Hospital day

K.pneumoniae*: Klebsiella pneumoniae*

LMIC: Low- and Middle-Income Countries

NC: New Caledonia

WHO: World Health Organization

PICT: Pacific island countries and territories

MRSA: Methicillin-resistant Staphylococcus aureus

VRE: Vancomycin Resistant Enterococci

ABSTRACT

Introduction

Antibiotic resistance is the phenomenon of bacteria becoming resistant to the action of antibiotics. This could lead in the next few years to the death of thousands of people, as a result of simple infections. To monitor this phenomenon of antibiotic resistance, surveillance networks have existed for several years in mainland France. In New Caledonia, responsibility for health fall within the jurisdiction of local institutions. The responsibility of the competent authorities is therefore to establish an inventory of the phenomenon of antibiotic resistance, and to assess whether the public policies put in place have been effective in their actions.

Methods

Antibiotic consumption and bacterial resistance data were collected in community and hospital settings, in the private and public sectors. They were mostly declarative, but some data were collected through a pre-existing monitoring network. The impact of the implementation of public health actions has been assessed on the phenomenon of antibiotic resistance.

Results

Antibiotic consumption overall is higher in New Caledonia than in mainland France.
Excessive consumption of antibiotics appears to be positively correlated with antibiotic resistance.
The hospital department generating the greatest number of resistances is surgery.
The consumption profiles are similar to other Pacific islands: this makes it possible to argue in favor of the misuse of penicillins.
Targeted antibiotic resistance issues have been successfully addressed by the competent authorities in a collaborative manner.

Discussion and conclusion

The consumption of antibiotics in New Caledonia is too high, which seems to be correlated with antibiotic resistance.
Aberrant levels of consumption and resistance having been noticed at the CHT, further investigations would be necessary to determine whether this is linked to misuse or to an epidemic context, thanks to monthly data, and thanks to interviews with prescribers.

INTRODUCTION

Antibiotic resistance

Antibiotic resistance is the phenomenon of bacteria becoming resistant to antibiotics. Bacteria exposed to antibiotics evolve and develop defense mechanisms that allow them to escape their action. This phenomenon affects both the bacteria that cause infections (pathogenic bacteria) and the generally harmless bacteria that are naturally present on our body (so-called commensal bacteria), in animals (pets or food production) and in our environment. When resistance has developed in one or other of these bacterial species, it can be transmitted to other species, and thus contribute to the spread of this phenomenon. Antibiotics thus become ineffective and can no longer treat us against infections caused by resistant bacteria. The extensive and repeated use of antibiotics in human and animal health is responsible for the increase in bacterial resistance to antibiotics, raising fears of increasingly frequent therapeutic impasses. [1]

Antibiotic resistance has gradually developed and now affects all pathogenic bacteria. It mainly results [2] from the repeated administration of antibiotics in humans or animals which creates conditions, called “selection pressure” that privileges the acquisition and dissemination of antibiotic-resistant strains. Today, new molecules are rare and it is sometimes difficult, if not impossible, to treat certain infections.

Antibiotic resistance can result from several mechanisms:

- Production of an enzyme that modifies or destroys the antibiotic
- Modification of the antibiotic target
- Waterproofing of the membrane of the bacteria

Some bacteria are naturally resistant to antimicrobials. More concerning, acquired resistance refers to the appearance of resistance to one or more antibiotics in a previously susceptible bacterium. These resistances can arise via a genetic mutation affecting the bacterium's chromosome, or be linked to the acquisition of foreign genetic material (plasmid, transposon) carrying one or more resistance genes from another bacterium. [3]

Antibiotic resistance is not a new phenomenon. Alexander Fleming, scientist at the origin of the discovery of penicillin, was one of the first to warn about this problem, foreseeing the threat linked to a bad use of the molecule. History proves him right, since the first

multi-resistant bacteria (BMR) appeared in the 1970s, while highly resistant bacteria (BHRe) appeared in the 2000s. [4]

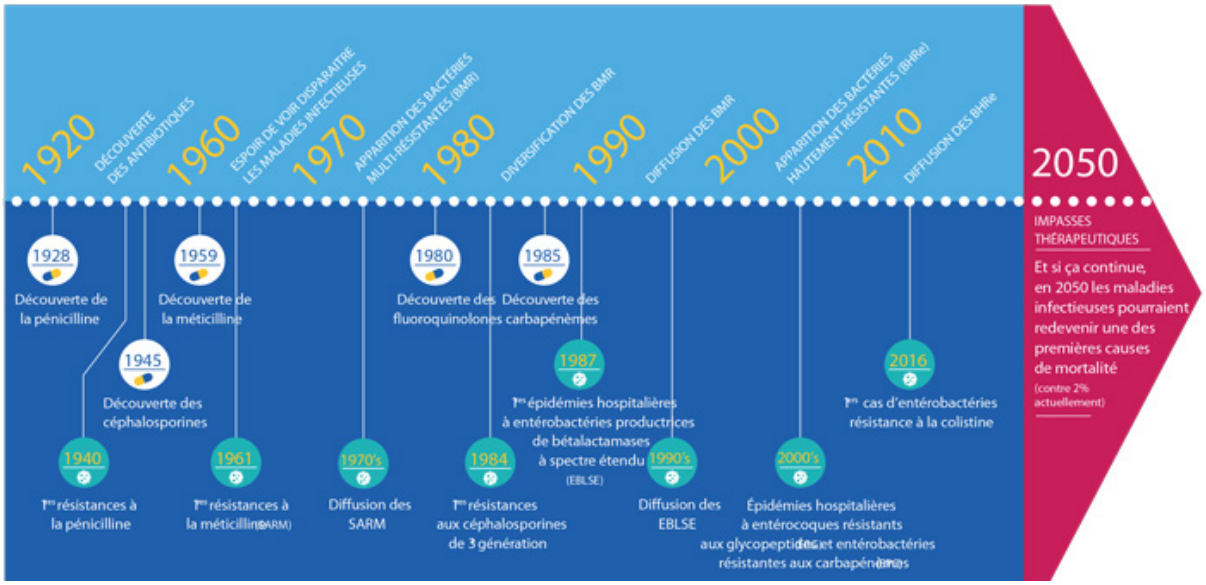

Figure 1: Story of antibiotic resistance

The consequences of the ineffectiveness of antibiotics are multiple:

- Longer and more difficult to treat illnesses;
- Complications of the disease;
- Additional medical consultations;
- Use of more powerful and more expensive drugs to achieve treatment;
- Higher risks during medical interventions, for which antibiotics are essential to reduce the risk of infection;
- Deaths caused by previously easily treatable bacterial infections.

Bacteria that have become resistant to antibiotics are found in most infections such as skin infections, meningitis, sexually transmitted infections, urinary tract infections or respiratory tract infections such as pneumonia [5].

In France, antibiotic resistance causes 5,543 deaths per year in patients with resistant bacteria infections and 124,806 patients develop an infection linked to a resistant bacteria, according to a study by the European Center for Disease Prevention and Control (ECDC). A recent article estimates that almost 1.3 million deaths are attributable to antibiotic resistance in the world in 2019. [6] In addition to the cost in human losses, the financial cost of care for

society would amount to more than 1.5 billion euros in Europe and more than 100,000 billion dollars worldwide. [7]

Conceptual framework

New Caledonia is a French archipelago located in the South Pacific region, 1200 kilometres east of Australia. [8] A little less than 300,000 inhabitants live in three different provinces: Province Sud, Province Nord, and Province des Iles Loyauté. [9] Nearly two-thirds of the inhabitants live close to the capital city, in the Wide-Noumea area. There are 344 physicians in New Caledonia.
Regarding establishments for the elderly, 16 establishments comprising nearly 627 beds are currently in operation, distributed mainly in the Wide-Noumea area.

In the public sector, there are two biomedical analysis laboratories: one at the Centre Hospitalier Territorial (CHT) Gaston Bourret (activities in biochemistry, hemostasis, anatomy and pathological cytology) which is the reference laboratory in microbiology for the territory; the other at the Centre Hospitalier du Nord, which develops a multi-purpose activity on the two hospital sites, Koumac and Poindimie. In the private sector, 15 medical analysis laboratories are approved in the liberal sector: eight in Noumea, two in Dumbea, two in Mont-Dore, one in Païta, one in Bourail and one in Kone. [10]

Specificities of the territory in its fight against antibiotic resistance

New Caledonia is not spared by this global worldwide epidemic. It is an overseas collectivity with a special status, since it benefits from shared sovereignty and partial autonomy. This autonomy concerns health in particular: the French public health code is not enforceable, the territory is therefore competent to legislate and regulate in this area. [11]
However, this excludes this territory from most existing antibiotic resistance monitoring programs in mainland France. The only estimate of antibiotic resistances is made thanks to the CHT, the territorial hospital centre of New Caledonia. It therefore concerns only one out of the six hospital facilities in the territory (see APPENDIX 1), and does not take into account the resistance encountered among the community or in EHPADs. In addition, since the data collection methods are not standardized with other establishments, it is impossible to make correct and valid comparisons.

Consequently, the health and research agencies must investigate themselves in order to evaluate the consumption of antibiotics, the levels of resistance observed, and the impact of the public health measures taken to solve this problem: this is the subject of this thesis.

OBJECTIVES

Main objective

Estimate whether public health policies have an impact on the consumption of antibiotics and the level of resistance observed in the territory.

Secondary objectives

- Make an inventory of antibiotic consumption in New Caledonia
- Determine the type and number of resistances observed in New Caledonia
- Determine how New Caledonia ranks in its consumption of antibiotics, compared with mainland France
- Establish comparisons with other Pacific islands in order to find territorial specificities
- Determine if the regulations put in place so far are effective on antibiotic resistance

METHODS

Care offer

New Caledonia has three public hospitals and one private clinic. These establishments fall under the jurisdiction of the DASS-NC, which is in charge of health competence in the territory. The Gaston-Bourret Territorial Hospital Centre (CHT) is the reference hospital of the archipelago. All high-tech treatments are performed in this establishment. It includes 645 beds, 12 operating rooms, medicine, surgery and intensive care units. It lists approximately 40,000 hospitalizations per year. The Albert Bousquet Specialized Hospital Center (CHS) has a total of 100 beds for psychiatric patients, and 80 beds reserved for gerontology. In addition, the Centre Hospitalier du Nord (CHN) has 63 beds and the private clinic Kuindo-Magnin, 270 beds. Finally, the Aftercare and Rehabilitation Center (CSSR) has 85 full hospital beds. [12]

Manual data collection

Data were collected manually, in a declarative way. Indeed, the data collection system on antibiotic resistance is very incomplete in New Caledonia. Only the Gaston-Bourret Territorial Hospital Centre is part of the ConsoRes antibiotic consumption and bacterial resistance network. This is a tool developed by the CClin-Est allowing for healthcare establishments to adapt their policy for the proper use of antibiotics by collecting and cross-monitoring antibiotic consumption, and bacterial resistances.

ConsoRes also enalbing automatic export of data to national monitoring databases (ATB-raisin). As a result, the use of this tool is articulated with the collection of the national ICATB indicator. [13] Other data were obtained asking who could fill in Excel tables. These tables were sent to people who were able to provide antibiotic consumption data (by ATC class), as well as some bacterial resistance data.
The classes of antibiotics studied are: tetracyclines, phenicols, penicillins, other beta-lactams, sulfonamides, macrolides, lincosamides and streptogramins, antibacterial aminoglycosides, antibacterial quinolones, combinations of antibacterials, as well as rifampin, oral imidazoles, and fidaxomicin. Only systemic antibiotics (ATC class J01) were investigated, with the exception of fusidic acid, the topical consumption of which was also analyzed.

In terms of bacterial resistance, it is sought:

- Number of strains of S.aureus isolated from blood cultures
- Number of strains of S.aureus isolated from superficial pus
- Number of strains of S.aureus oxa-R isolated from blood cultures
- Number of strains of S.aureus oxa-R isolated from superficial pus
- Number of strains of E. faecium isolated from blood cultures
- Number of E.faecium vanco-R strains isolated from blood cultures
- Number of strains of K.pneumoniae resistant to third generation cephalosporins (ATC class J01DD)
- Number of K.pneumoniae strains isolated from blood cultures
- Number of strains of K.pneumoniae resistant to carbapenems (ATC class J01DH) isolated from blood cultures
- Number of enterobacteriaceae resistant to carbapenems (ATC class J01DH)

Excel tables including the different municipalities of New Caledonia accompanied by an explanatory electronic message containing the ins and outs of the project and instructions regarding data were sent to the private medical biology laboratories (see APPENDIX 3 and 4), in order to establish a map of the resistances observed (based on the address of the patients).

They were asked to provide the following data:

- Number of E.coli strains isolated from urine
- Number of strains of K.pneumoniae isolated from urine
- Number of E.cloacae strains isolated from urine
- Number of E.coli strains isolated from urine resistant to 3rd generation cephalosporins (C3G)
- Number of E.coli strains isolated from urine resistant to fluoroquinolones
- Number of strains of E.coli, K.pneumoniae, and E.cloacae resistant to carbapenems

These figures will allow us to obtain:

- The proportion of E.coli resistant to 3rd generation cephalosporins in urine in the city
- The proportion of E.coli resistant to fluoroquinolones in urine in the city
- The proportion of E.coli, K.pneumoniae and E.cloacae resistant to carbapenems in urine in the community

These data only concern patients at home, and not patients in EHPADs.
In this way, they are comparable with those obtained in the detailed table of impact indicators of the 2022-2025 national strategy for the prevention of infections and antibiotic resistance.

These data use those of Géodes, the cartographic observatory of epidemiological indicators produced by Public Health France. The data presented there comes from numerous specific surveillance systems, the SurSaUD® syndromic surveillance system, epidemiological surveys in the general population and databases from the National Health Data System (SNDS). [14]

Similar messages, with Excel tables showing the different consumptions of the above-mentioned antibiotic classes, to be filled in according to the years and to be distributed according to the different units and with a table where to fill in different bacterial resistances were sent to the Territorial Hospital Center Gaston-Bourret (CHT), Aftercare and Rehabilitation Center (CSSR), Northern Hospital Center (CHN), Albert-Bousquet Specialized Hospital Center (CHS) (see APPENDIX 5, 6, 7 and 8). No message was sent to the Kuindo-Magnin private clinic.

In terms of bacterial resistance, it was sought:

- Number of strains of S.aureus isolated from blood cultures
- Number of strains of S.aureus isolated from superficial pus
- Number of strains of S.aureus oxa-R isolated from blood cultures
- Number of S.aureus oxa-R strains isolated from superficial pus
- Number of strains of E. faecium isolated from blood cultures
- Number of E.faecium vanco-R strains isolated from blood cultures
- Number of strains of K.pneumoniae resistant to C3G (ATC class J01DD)
- Number of K.pneumoniae strains isolated from blood cultures
- Number of strains of K.pneumoniae resistant to carbapenems (ATC Class J01DH) isolated from blood cultures
- Number of enterobacteriaceae resistant to carbapenems (ATC class J01DH)

In addition, the elderly are a very important part of the population to target, because of their often high antibiotic consumption compared to the general population: this is why an even different table was sent to the coordinating doctors of EHPADS, so that they can fill in the data corresponding to the consumption of antibiotics, and the resistance observed in this section of the population. Unlike previous targets, responsible persons were not asked to provide this information, but physicians, because that it is impossible to obtain antibiotic resistance and antibiotic consumption data for this single population without having access to confidential data (see ANNEX 9 and 10).

Finally, in order to obtain the consumption of antibiotics by municipality as well, a table listing the different classes of antibiotics previously exposed was sent to the two pharmaceutical wholesalers present in the territory, namely GPNC and Unipharma (see ANNEX 11 and 12).

Data Privacy

The management of confidential data was supervised by the data protection officer of the General Secretariat of the Government of New Caledonia.
The data collected is confidential and is subject to Regulation (EU) 2016/679 of the European Parliament and of the Council of April 27, 2016 on the protection of confidential data.

Comparison with mainland France

If the data obtained in New Caledonia comes directly from the heads of structures or health professionals, the data comes from well-defined networks and databases in mailand France:

- **ANSM data**: The data come from the sales declarations that pharmaceutical companies send each year to the ANSM. These mandatory declarations, provided for in Article L 5121-18 of the Public Health Code, relate to all the specialties marketed in France (metropolitan France + DOM), whether or not they are reimbursable. These are exhaustive data and therefore do not require any extrapolation. They are indicated in this report by the mention “source: ANSM”.
- **IMS-HEALTH EPPM data.** These are panel data from the Permanent Medical Prescription Sample (EPPM). The EPPM is a quarterly study on the diseases and prescription habits of general practitioners and specialists in liberal activity (at least 50%). Its panel is made up of a representative sample of 1180 general practitioners or specialists, whose measured activity is extrapolated. The data it contains therefore relate exclusively to prescriptions made in the city. In particular, they make it possible to associate a diagnosis with a pharmaceutical prescription and to know the main characteristics of the patient (age and sex in particular). Prescription durations and co-prescriptions are also available. The extractions and treatments were carried out by the ANSM and are therefore under its sole responsibility. These data are indicated in this report by the mention “source: IMS-Health – EPPM (ANSM processing)”.

- **OPEN-MEDIC data**. The Open Medic public data offer is made up of a set of annual databases, relating to drugs dispensed in city pharmacies (Metropolis + Overseas regions and departments) and subject to reimbursement by a health insurance scheme. The data used here come from the Complete Base on Inter-Plan Medication Expenditures (Sniiram), making it possible in particular to break them down according to the region of residence of the beneficiary. The extractions and treatments were carried out by the ANSM and are therefore under its sole responsibility. These data are indicated in this report by the mention “Source: Open Medic (ANSM processing)”.
- **European data from ECDC**. These are data published by the European Center for Disease Prevention and Control (ECDC), as part of the ESAC-NET network. These are data, expressed in number of DDDs, transmitted by each country participating in this network: their source may therefore vary. In some countries, reimbursement data is provided, but in others, such as France, it is sales data. These data are generally exhaustive but sometimes give rise to extrapolations. Finally, some countries cannot dissociate ambulatory consumption from hospital consumption and therefore transmit overall results.

Data standardization

In order to obtain the most comparable data possible between New Caledonia, mainland France and the other Pacific islands, the data was collected in the same way as those obtained in the indicators provided by the Ministry of Solidarity and Health.

Methodology for calculating the quantity of doses

The antibiotic consumption data used for this collection have been converted into the number of Defined Daily Doses (DDD). Established under the aegis of the WHO Collaborating Center for Drug Statistics Methodology, the DDD constitutes a reference dosage for a 70 kg adult in the main indication of each molecule. It is a standard of measurement, which does not constitute a dosage. The use of DDJs thus eliminates the difficulties of measurement linked to the heterogeneity of the packaging sizes and dosage of the drugs marketed. It is calculated by multiplying the amount consumed by the unit dosage, and dividing it by the WHO DDD. To take into account population differences from one country to another, the number of DDDs is divided by the total number of inhabitants (including children). By convention, the results are presented per thousand inhabitants and per day (DDD/1000H/D). This indicator therefore makes comparisons possible and makes it possible to calculate,

where appropriate, an average international consumption. The version of the ATC classification used is that of January 2016 and all calculations have been made on this basis. When the medicinal product is composed of two active substances, the calculation rules set by the WHO for the combinations have been used. For this report, only antibiotic substances classified in class J01 have been retained. [15]

Fusidic acid: Only oral preparations in ATC group “D” relating to dermatology receive DDDs. Most of the products in this group are for topical use and no DDD is assigned because the amount administered per day can vary widely depending on the intensity and distribution of the disease. The consumption figures for these dermatological preparations can be expressed in grams of preparations regardless of their dosage.
Amoxicillin/Clavulanic acid: When establishing DDDs for combination products, both components are considered, using a list of DDDs for combination products available on the WHO website.

DDDs for anti-infectives are generally based on use in infections of moderate severity. However, some anti-infectives are only used in severe infections and their DDDs are assigned accordingly. DDDs assigned are based on daily processing. The length of the treatment periods is not taken into consideration. For anti-infectives given at a high initial dose followed by a lower "maintenance" daily dose, the DDDs are based on the "maintenance" dose if the total duration of treatment is greater than one week. If, however, the duration of treatment is seven days or less, DDDs are assigned based on the average daily dose, i.e. the total dose of treatment divided by the number of days of treatment (e.g. , azithromycin).

The DDD is only one example of indicators used to monitor the use of antibiotics, but there are others: the number of individuals exposed (or newly exposed) per unit of time, or the number of treatments (or new treatments) per unit of time. These data can be evaluated via the cost, the number of units, or the number of prescriptions. The major problem in these calculation methods is that the values can vary between regions and countries over time. This limits comparisons of drug consumption at the international level. The DDD allows comparisons of drug consumption between different populations. It is this indicator that was retained by the European Antibiotic Consumption Monitoring Program (ESAC). [16]

ATC classification

These antibiotics are classified by ATC classes. The Anatomical, Therapeutic and Chemical Classification System - commonly known as the ATC classification - is used to classify drugs. It is controlled by the Collaborating Center for Drug Statistics Methodology of the World Health Organization. The ATC classification is based on five classification levels which correspond to the target organs (or organ systems), and to the therapeutic, pharmacological and chemical properties of the different products. The general form of the code for a molecule is *LCCLLCC*, where L represents a letter and C a number (example: A01AA01). Each letter and each doublet of digits represents a successive level.
The first level (first letter) defines the anatomical group among 14 different ones. The second level (first two digits) gives the main pharmacological or therapeutic subgroup. The third and fourth levels (second and third letters) correspond to chemical, pharmacological or therapeutic subgroups. The fifth and last level (last two digits) indicates the chemical substance.[17]

Construction of the database for the DDDs

In order to calculate these DDD, it was necessary to have a database enabling to have the DDD for each box of medicine, and this for each systemic anti-infective of the ATC J01 class. Public Health France is undoubtedly in possession of this database: I therefore contacted them in order to have access to it or at least to validate my calculations, and thus to avoid having biased results. Unfortunately, Santé Publique France did not respond to my requests. So I created the databases myself.

Thanks to the Guide for a method of calculating the consumption of antibiotics in health establishments and in the city (2006 version) [18] and thanks to the ATC/DDD index of the WHO [19] , we were able to put, for each reference, thanks to level 5 ATC codes, the DDDs for each molecule. Then, you have to go see the drug's instructions on an official government site, the Public Drug Database. [20] This is an administrative and scientific database on the treatment and proper use of health products which is implemented by the National Agency for the Safety of Medicines and Health Products (ANSM), in liaison with the High Authority for Health (HAS) and the National Union of Health Insurance Funds (UNCAM), under the aegis of the Ministry of Social Affairs and Health. It allows for the general public and health professionals to access data and reference documents on drugs marketed or having been marketed during the last three years in France. This notice made us able to know the

number of units per box, but also the quantity of product per unit. Thus, by multiplying the number of units in the product, by the quantity of active substance per unit, we can have the total quantity of the antibiotic concerned and divide this quantity by the value of the DDD in grams for this same antibiotic. [21]

This DDD has its limits: in fact, it alone does not provide information on the number of people exposed during the period. It is therefore difficult to interpret to materialize the importance of exposure to antibiotics outside the context of geographical or temporal comparisons (for example, the case of healthcare teams or working groups in charge of usage policies). antibiotics in hospitals). Nevertheless, this unit behaves quite correctly to establish spatio-temporal comparisons between exposure to antibiotics and rates of resistance to antibiotics. In addition, it makes it difficult to interpret comparisons when the doses or durations actually prescribed vary according to the populations. For example, pediatric DDDs do not exist, comparisons based on population age distributions are therefore impossible, so adult DDDs will have to be used. Another example is the variation in the effective dosage for the same indication, which can easily distort the results by giving the impression that there are many more people treated. Finally, the contents of the boxes are not always completely consumed since the size of the boxes does not necessarily correspond to the standard dosage.

In healthcare establishments, boxes delivered by pharmacies for internal use are generally considered to be consumed in clinical departments, which is not necessarily the case (departures, department transfers, treatment changes, etc.). This is all the more true since the data obtained is essentially declarative, and essentially based on sales volumes and not individual consumption, adding bias to the results obtained.

It should also be specified that:

- In the case of associated forms of antibiotics, when an association includes two antibiotics, each can have a selection action on the bacteria. It will then be necessary to dissociate these 2 antibiotics and take into account the 2 respective DDDs. For sulfonamides in combination, two cases arise. Either it is an association with trimethoprim, in which case the WHO has already proposed a DDD , or it is not the case, and it is then sufficient to take into account the DDD of the sulfonamide present in the combination. For combinations comprising an antibiotic and an associated inhibitor, if no DDD is proposed by the WHO, only the DDD of the antibiotic will be taken into account.

It is exceptional that there is no DDD for an antibiotic. Nevertheless, in the absence of DDD, it is not possible to take into account the antibiotic concerned for the moment (new calculation methods will be developed in the years to come). [16]

Antibiotic resistance

Three different methods exist to assess resistance to antibiotics: it is the number of "tests" carried out, i.e. the test of the sensitivity of the bacterial strain to the antibiotic(s) (s), the percentage of resistance, which together calculates the number of resistant and intermediate strains, and divides it by the total number of strains; and the incidence, which adds the number of resistant and intermediate strains, and divides them by the number of hospital days multiplied by 1000.

Here, the method chosen to assess antibiotic resistance is percentage resistance. It has the advantage of including intermediate and resistant strains in the "resistant" category, and given that I was unable to get the number of hospital days from the CHT, it is the only reliable indicator that it was possible to use.

ConsoRes

ConsoRes is a network tool for listing antibiotic consumption and bacterial resistance in hospitals in mainland France and the overseas departments and territories.[13] In 2017, 1,681 establishments were part of this network. [21] On the ConsoRes website, I was only authorized to access data from the CHT Gaston-Bourret establishment. This prevented me from making certain comparisons with metropolitan hospitals. Nevertheless, I was able to collect and compare certain data thanks to presentations and articles produced by the pharmacist-biologist of the CHT, Julien Colot. The data had to be filled in according to the functional unit, which is the key to all the data in ConsoRes. There had to be at least one functional unit per sector of activity (surgery, intensive care, etc.).

Statistical analysis

The data collected relates to the year 2019, 2020, 2021 and the first quarter of 2022. This choice was made because the most recent data is the easiest to obtain. CHT Gaston-Bourret is an exception to this rule, as its data has been listed on ConsoRes since 2017.

The number of data points is therefore 4, which is low. It can even go down to 3, because the CHT only lists its antibiotic consumption annually. This is too little to carry out trend analyzes or valid correlations. Nevertheless, this allowed for feedback from pharmaceutical wholesalers, medical biology laboratories, EHPADs and hospitals. As this data has to be extracted manually (with the exception of the CHT Gaston-Bourret), the prospect of having to extract a lot of data can be daunting, which would not have allowed me to obtain timely feedback. Furthermore, all trends taking into account the “1st quarter 2022” point must be judged with caution, as the result cannot be considered comparable to the other annual points: it can only be used for an estimate.

Statistical analyses, when possible, were performed using XLSTAT software version 2022.3. The evolution of resistance rates was studied with a Cochran-Armitage test. The tests were chosen 2-sided, and the cutoff p-value was 5% for the result to be considered significant.

RESULTS

In community

With an estimated population of 271,960 in 2020, the total DDDs for each ATC 3 class have been calculated for the years 2019, 2020, 2021, and for the 1st quarter of 2022.

This gives an overall consumption in DDD of all antibiotics dispensed in community pharmacies per 1,000 inhabitants per day.

We did not obtain a response from the coordinating doctors of EHPADs, and therefore the analyzes relating thereto could not be provided.

Antibiotic consumption

Here are the results of the consumption of systemic antibiotics in New Caledonia for 2019.

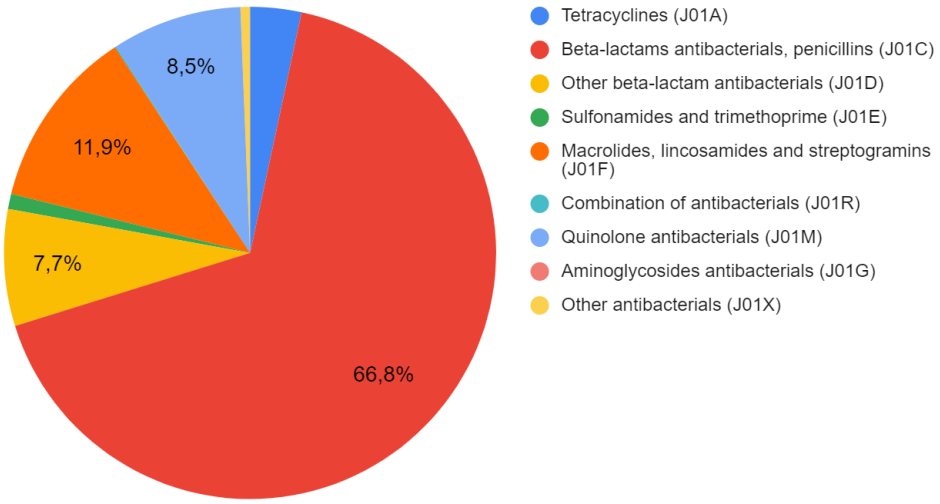

Figure 2: Distribution of the consumption of systemic antibacterials (ATC group J01) in 2019)

For the sake of readability, the very little used ATC classes, namely the combination of antibacterials (J01R), aminoglycosides (J01G) and other antibacterials have been grouped into a single class: the other substances of class J01. This presentation follows the one put forward by the ECDC in the presentation of its results.

In order to compare the consumption trend over the years with France, a stacked histogram is produced.

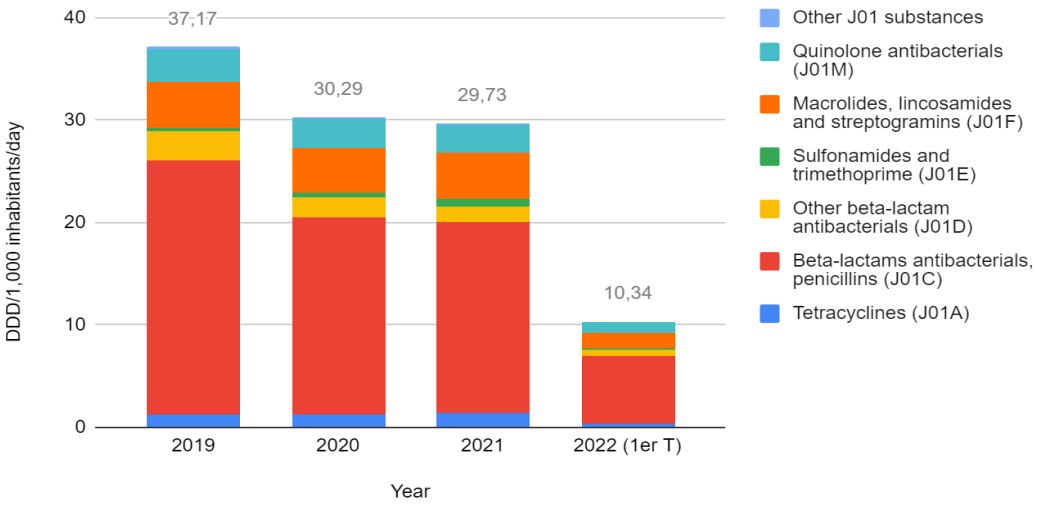

Figure 3: Trend of the consumption in the community (primary care sector) of ATC group J01 in New Caledonia

We can thus analyze consumption in the city of New Caledonia, and compare it with that provided by the ECDC for France (see APPENDIX 13). We quickly see that the consumption profiles are quite similar.

In terms of quantities consumed, the quantities are greater in Caledonia: in 2019, they were 37.17 DDD/1000 inhabitants per day compared to 23.34 in France, and 30.29 DDD/1000 inhabitants in New Caledonia in 2020 compared to 18.10 in France.

It can be seen that the group of antibiotics most consumed is that of beta-lactams and penicillins, while that of sulfonamides and trimethoprim, which is poorly represented, is increasing in its consumption from year to year.

Resistors Listed

Regarding resistance to antibiotics in the city, only nine laboratories out of the 14 questioned provided an answer. Among these laboratories, all belong to the Calédobio group. In this group the results arrived centrally for the groups Bioclinic SELAS, Biocal SELAS, Central SELAS Laboratory, on 3 different Excel files containing different information; and on a single file for the Biobrousse SELARL group. This information has been separated into several files because the computer system changed in 2021 for the Calédobio group.

For the period from 2019 until the end of the 1st quarter of 2022, 12557 strains of E.coli from urine samples were isolated, 2021 from K.pneumoniae, and only four from E.cloacae. The proportion of E.coli resistant to third-generation cephalosporins is between values of 3.28% during the first quarter of 2022, and 6.00% in 2020; the proportion of E.coli resistant to fluoroquinolones varies between 13.20% during the first quarter of 2022 and 17.18% in 2020; finally, the proportion of E.coli, K.pneumoniae and E.cloacae is between zero in the first quarter and 0.04% in 2021.

	Proportion of *E.coli* resistant to 3GC	**Proportion of*E.coli* resistant to fluoroquinolones**	**Proportion of*E.Coli*/ *K.pneumoniae*/ *E.cloacae* resistant tp carbapenems**
2019	4,43%	16,86%	0,03%
2020	6,00%	17,18%	0,02%
2021	4,45%	15,69%	0,04%
1st T 2022	3,28%	13,20%	0,00%

Comparison with France

For comparison, E.coli resistant to 3rd generation cephalosporins was 3.40% in France in 2019 versus 4.43% in NC, and 3.3% in 2020 in France versus 6.00% in NC . Similarly, 16.86% of E.coli were resistant to fluoroquinolones in NC in 2019, versus 11.4% in France, while this represented 17.18% in NC in 2020 versus 11.8% in France. [22] Nevertheless, given that the data relating to metropolitan France are not available for a period after 2020, and that the data relating to the NC are not available for a period prior to 2019, the comparability of these data is limited.

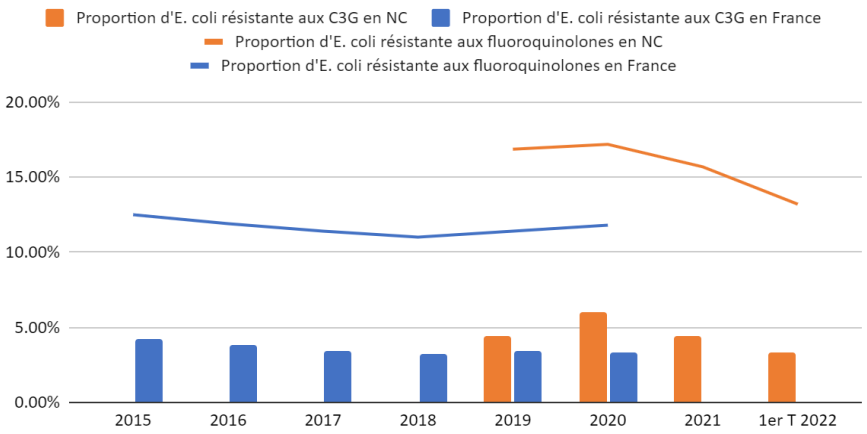

Figure 4: Evolution of bacterial resistances to C3G and fluoroquinolones in the primary care sector in France and New Caledonia

Regarding the resistance of E.coli, K.pneumoniae and E.cloacae to carbapenems, the values in mainland France are less than 0.5%, and the NC is below this limit value.

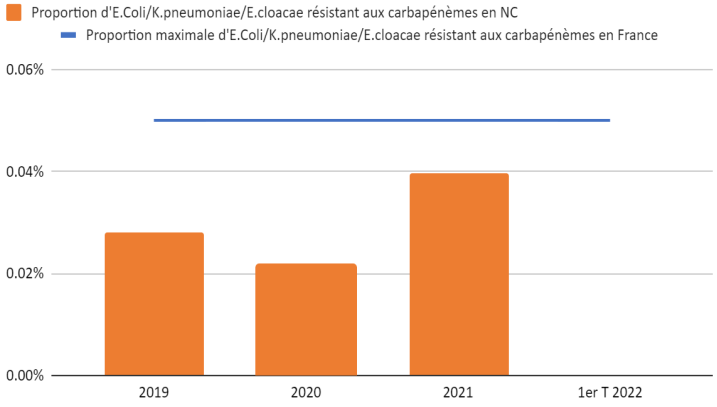

Figure 5: Evolution of bacterial resistances to carbapenems in primary care sector in France and New Caledonia

Correlation between resistance and antibiotic consumption in the city

E. coli resistance data to 3rd generation cephalosporins and fluoroquinolones compared to antibiotic consumption data in the community seem to indicate a correlation between the decrease

in consumption of the fluoroquinolone and C3G classes of antibiotics and the resistances associated with it.

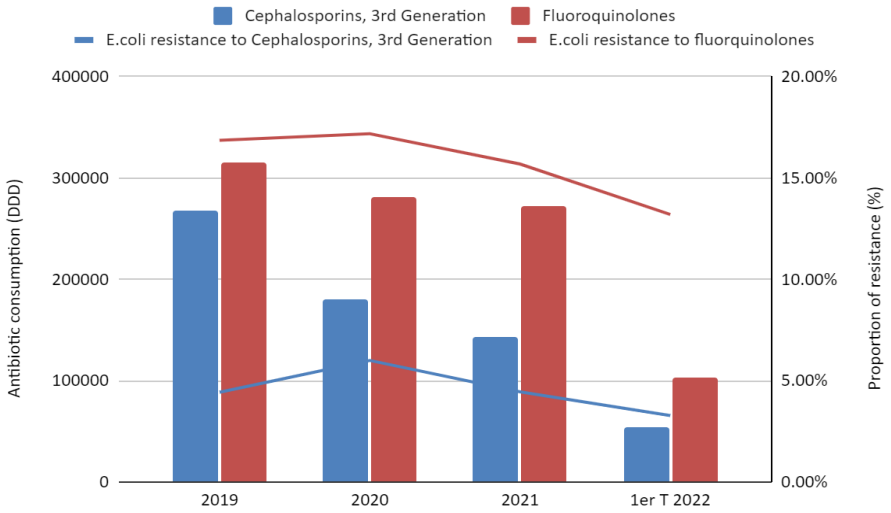

Figure 6: E.coli resistance to C3G and fluoroquinolones in primary care sector in New Caledonia

Regarding carbapenem resistance, the low number of carbapenem resistances of E.Coli, K. pneumoniae and E.cloacae strains (one in 2019, one in 2020 and two in 2021) does not allow any valid comparison.

In health facilities

Data from health establishments was collected only via feedback from CHT Gaston-Bourret; the CHS Albert Bousquet did not respond, the Center for Aftercare and Rehabilitation did not respond, and the CHN replied that it could not provide the data in the time allowed.

The table summarizing the consumption of antibiotics follows the one proposed in the Guide for monitoring the use of antibiotics in the community and in health establishments. [16]

Antibiotic consumption

Compared to the other establishments participating in the ConsoRes network, the CHT is among the establishments consuming the most antibiotics (765 DDD/1000 JH excluding anti-tuberculosis drugs, in 2021). It is nevertheless slightly less than in 2020 (787 DDD/1000 DH excluding anti-tuberculosis).

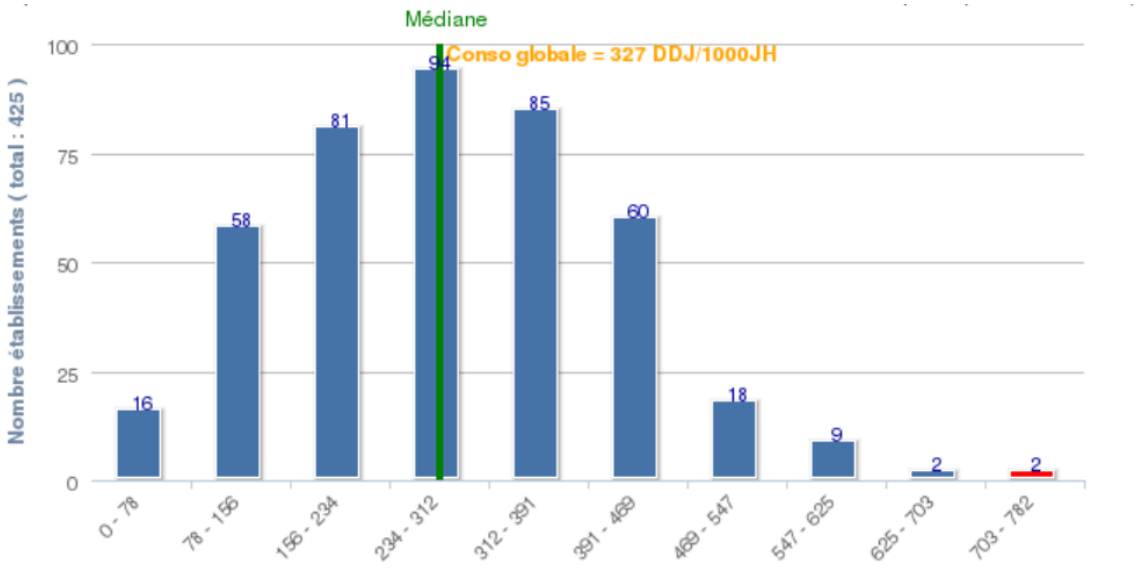

Figure 7: Antibiotic consumption of the CHT compared to other ConsoRes network's hospitals in 2021

The total antibiotic consumption of the CHT has remained relatively stable since 2017.

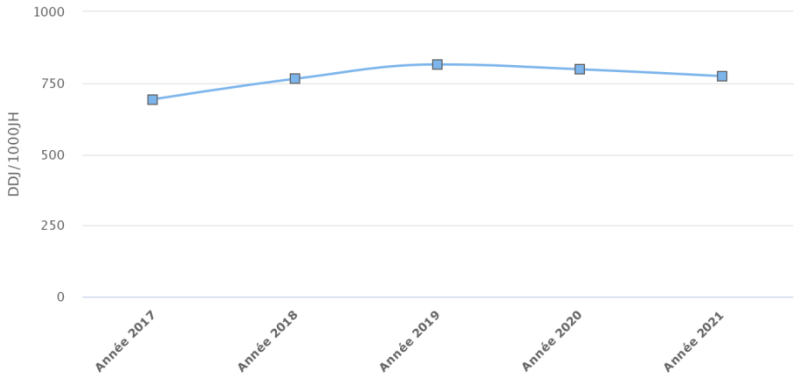

Figure 8: Evolution of the antibiotic consumption in the CHT Gaston-Bourret

Antibiotic resistance

Antibiotic resistance in healthcare establishments is only representative of the main healthcare establishment in the territory, the CHT Gaston-Bourret, which makes it difficult to extrapolate to the whole territory. In addition, the limited number of years, and the low number of resistances observed is an obstacle to obtaining reliable and significant data. These data must therefore be treated with the utmost care.

Furthermore, I was unable to obtain from the CHT Gaston-Bourret the number of days of hospitalization: consequently, the incidence densities could not be calculated, in order to compare them with metropolitan France (density of incidence of MRSA/1000 JH, incidence density of C3G-resistant K.pneumoniae/1000 JH, incidence density of all enterobacteriaceae resistant to carbapenems/1000 JH).

A paradoxical case: Resistance in the surgery department

By compiling the data of several resistances per department, it appears that the surgery department is the one with the most resistance.

We see that there is a total absence of data for psychiatry and long-term care services: this is due to the fact that these services do not exist at the CHT, since specific structures already exist elsewhere.

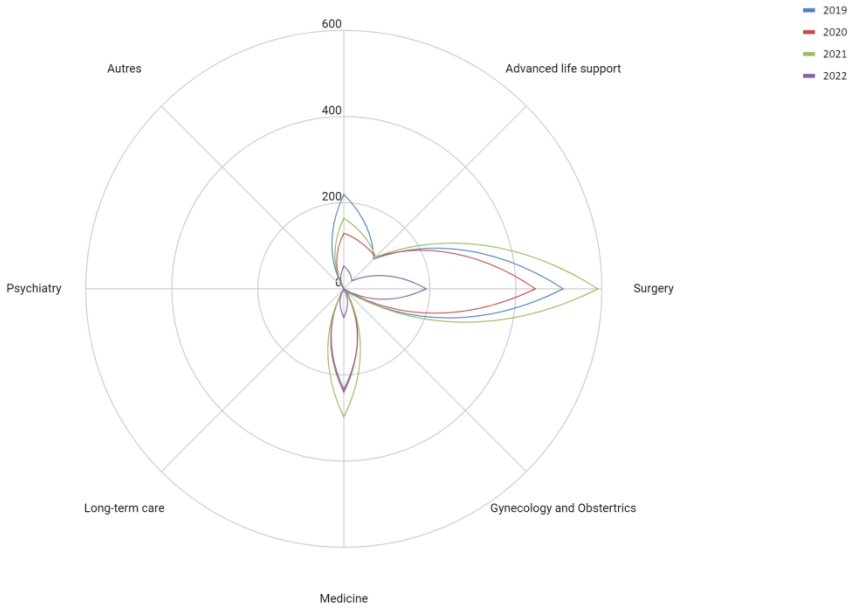

Figure 9: Combined resistances (*S.aureus* oxa-R, *E.faecium* vanco-R, *K.pneumoniae* C3G resistance, K.pneumoniae carbapenems resistance, enterobacteria carbapenem-resistance) in all departments

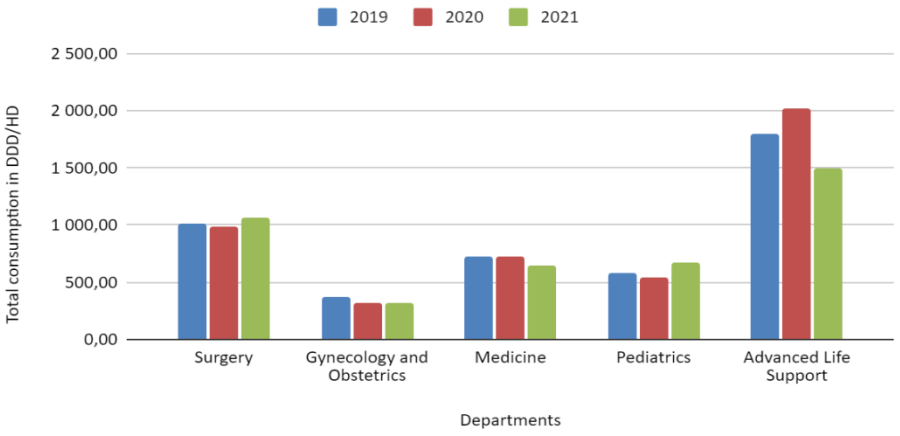

Figure 10: Antibiotic consumption according hospital's departments

By observing more precisely the consumption of antibiotics, we note that surgery is only in second position among the units consuming the most antibiotics: the service which consumes the most is that of intensive care.

Even more surprisingly, the majority of antibiotics consumed are penicillins: however, there is no known cross-resistance between penicillins and the classes of antibiotics involved in the resistances mentioned above, namely glycopeptides, C3G and carbapenems.

In addition, the resuscitation department, which records a higher consumption of penicillins than the surgery department (645.7 DDD/DJ in 2019 versus 508.2 DDD/DJ and 523.80 versus 510.7 DDD/DJ) experienced around 5 times less of these resistances than surgery.
In order to develop hypotheses on this anomaly, an audit should be carried out on the prescription of penicillins in the surgery department.

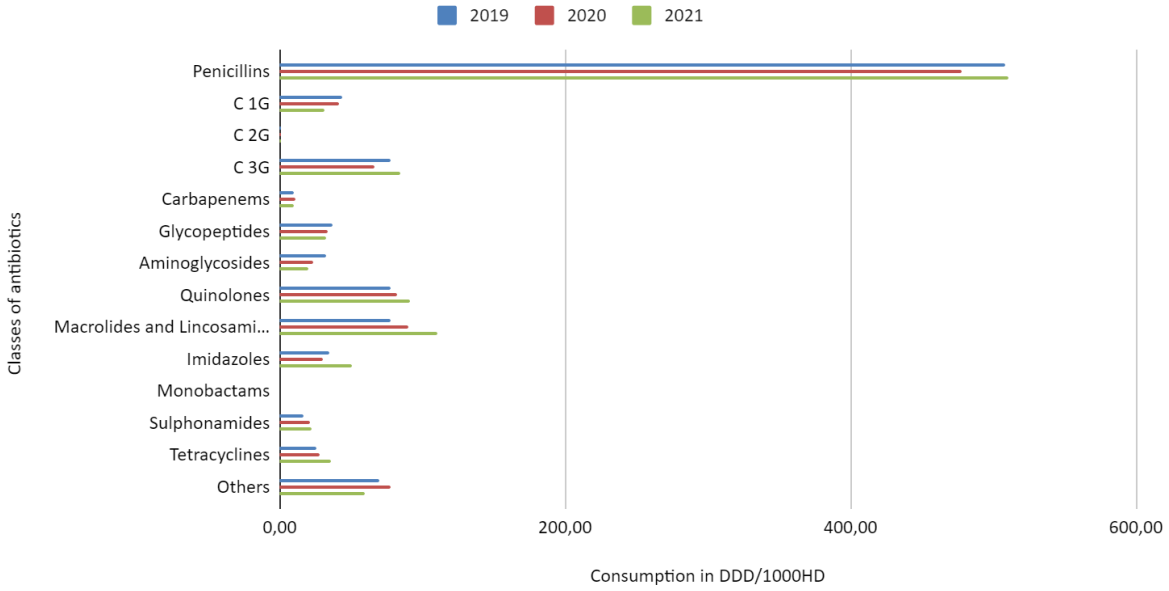

Figure 11: Antibiotic chemical classes' consumption in Surgery department

Other resistances

Methicillin resistance

Between 2019 and the first quarter of 2022, 3103 strains of Staphylococcus aureus were collected, and 1194 were identified as resistant to methicillin. The proportion of these resistant strains seems to decrease over the years.

In order to be able to compare these data with France, only strains of S.aureus from blood cultures are counted. This represents 773 strains out of the 3103 analyzed (24.91%) and 226 strains out of the 1194 resistant (18.93%). Statistical significance therefore decreases, while comparability increases.

In 2019, this rate was 13.9% in France, while it was 29.4% in NC that same year.

Vancomycin resistance

The resistance data of E.faecium to vancomycin are rather encouraging. Less than 5 strains were detected via blood cultures between 2019 and 2022, and none were detected resistant. Similarly, 15 healthy vancomycin-resistant E.faecium carriages were detected in 2019, compared to only 4 in 2020 and 24.5 in 2021).

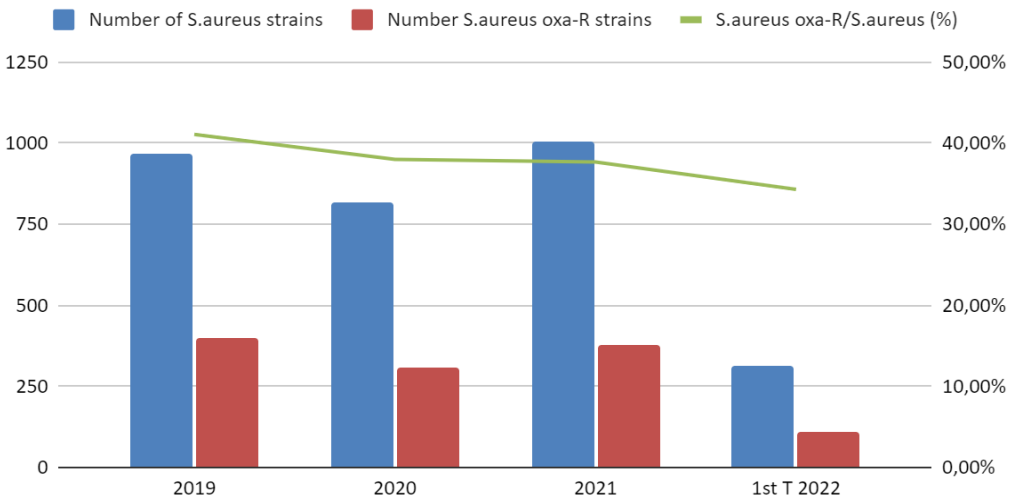

Figure 12: Evolution of MRSA in healthcare institutions in New Caledonia

3GC Resistance

We note that the consumption of C3G does not seem to be correlated with a greater number of resistances in K.pneumoniae.

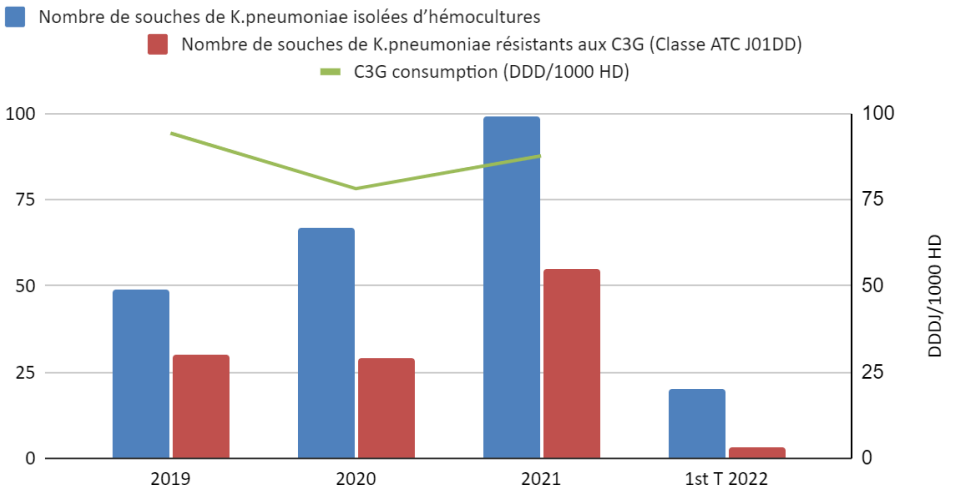

Figure 13: Evolution of *K.pneumoniae* resistance to C3G in healthcare institutions in New Caledonia

Resistance to carbapenems

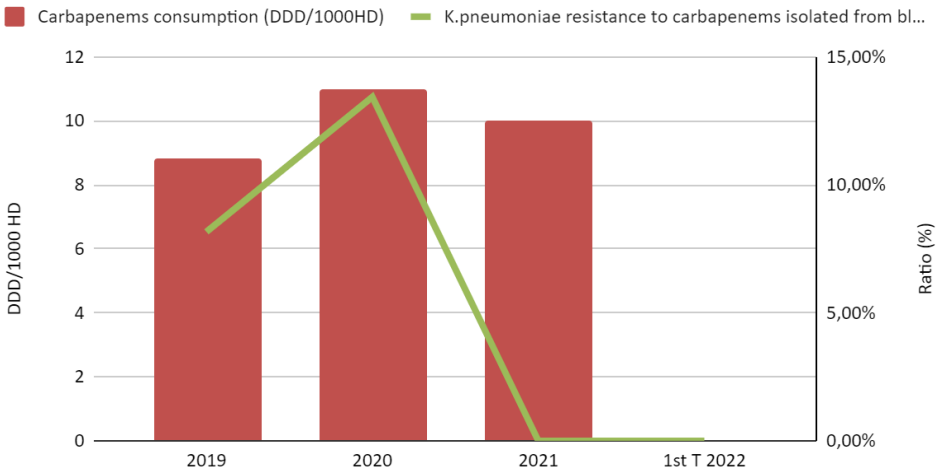

Figure 14: Evolution of *K.pneumoniae* resistance to carbapenems in healthcare institutions in New Caledonia

The proportion of strains resistant to carbapenems in K.pneumoniae isolated from blood cultures in healthcare establishments is 8.16 in 2019, 13.43 in 2020, before falling to 0.00% in 2020 and 2021. These significant variations are due to the low number of resistant strains isolated from blood cultures (four in 2019, nine in 2020, and none in 2021 and during the 1st quarter of 2022). By way of comparison, this proportion remains stabilized below the 1.00% mark in mainland France.

It is noted that the number of resistances in K.pneumoniae does not seem to be correlated with the consumption of carbapenems.

Parallel with other Pacific islands

The other Pacific islands were studied at the level of antimicrobial resistance, in order to provide comparable data with New Caledonia. The so-called PICTs (Pacific Island Countries and Territories) represent 22 members of the Secretariat of the Pacific Community, with the exception of France, Australia, New Zealand, the USA and France. France is compared differentially. These PICTs share many similarities, starting with their fragmentation and isolation. Relatedly, these territories are often economically isolated from major markets, and benefit from island economies. In addition, they are among the most vulnerable territories vis-à-vis climate change and natural disasters. Finally, most are LMICs.

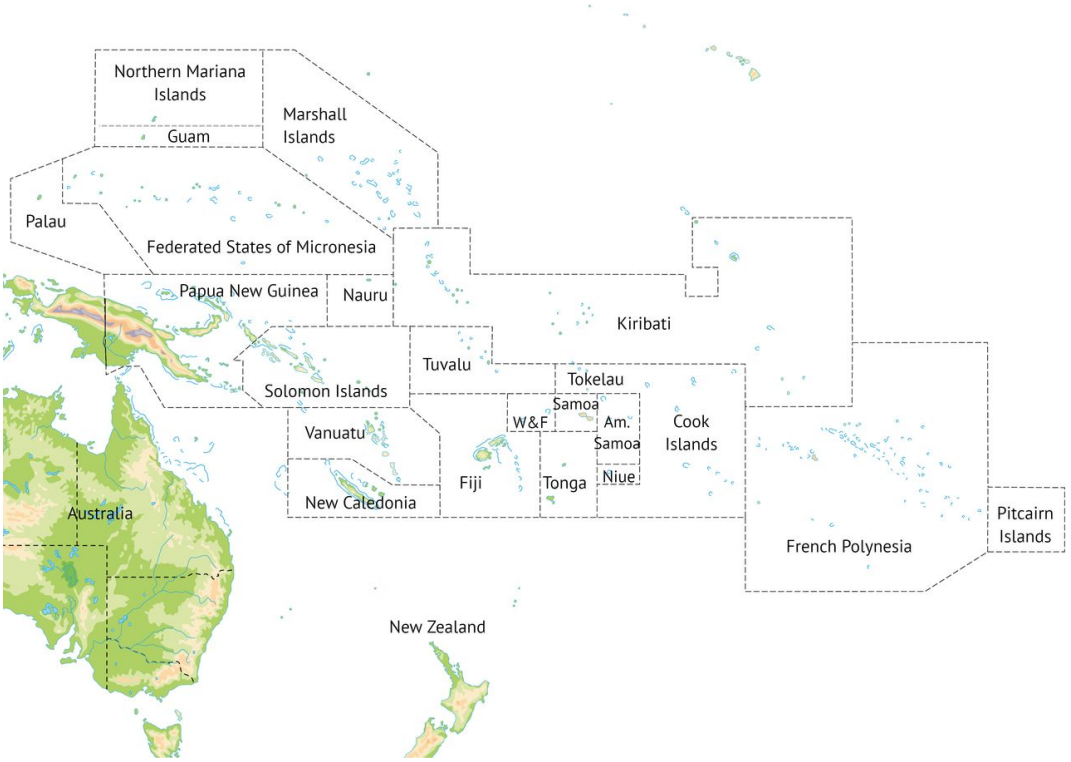

Figure 15: Map of Pacific Island Countries and Territories. (PICTs)

Unfortunately, few data, whether in terms of bacterial resistance or antibiotic consumption, exist for PICTs. Indeed, few studies have been published. [23] The isolates from these studies often come from the sickest patients, with testing being reserved only for the most extreme cases in settings where resources are limited: [24] this ultimately results in underestimating the overall infection rate, but to overestimate antimicrobial resistance rates. Finally, surveillance does not necessarily concern pairs of antibiotics and the resistance associated with them.

In addition, these data regularly present a lack in terms of quality, since the laboratories responsible for detecting these bacterial resistances may have a poor quality assurance system, and they face shortages in terms of equipment and personnel. qualified. [25]

Finally, these data are not always generalizable, which is one of the major concerns for this study: indeed, few antibiotic resistance estimates have been published over the past five years, and most were published before 2010. These data mainly represent New Caledonia, Fiji, Papua New Guinea, and certain demographic groups or sub-groups are over-represented (pediatric population). Finally, some are totally absent from these studies because they have not been tested (eg rural populations).

The available data do not allow any comparison concerning the resistance to antibiotics of E.coli and K.pneumoniae bacteria. [26] Indeed, the data collected at the level of the Western Pacific region is based on hospital data: the last collected date from 2017, while the recording of resistance by the Gaston-Bourret CHT began in 2018. Nevertheless , similar consumption profiles are observed in French Polynesia, also with overconsumption of penicillins where this seems to be linked to epidemic peaks, and significant misuse. In New Caledonia, the data not being available in such a precise manner, it is difficult to make assumptions as to the origin of this overconsumption. However, it is reasonable to think that the causes are similar.

A public policy response on a case-by-case basis

Case study: MRSA and regulation

Staphylococcus aureus is the strain of staphylococcus most frequently encountered in human and veterinary pathology. It shares with the bacterium Escherichia coli the first rank of germs responsible for nosocomial infections (infections contracted in the hospital). [27] This staphylococcus can also produce Panton-Valentine toxin, a leukotoxin responsible for severe skin and lung infections, with high morbidity. [28]

It is a formidable pathogen, which has been able to develop resistance to most antibiotics. The plasticity of its genome gives it the ability to adapt to all environmental conditions, and in particular to acquire antibiotic resistance genes and develop regulatory mechanisms to adapt to increasing concentrations of antibiotics. One of them is resistance to methicillin, which will make it possible to classify S.aureus into two categories: methicillin-resistant Staphylococcus aureus (MRSA) and the others. [29]

In New Caledonia, it is the main bacterial species encountered, especially in dermatological conditions. This spread was originally mainly nosocomial, but over time became community-based.

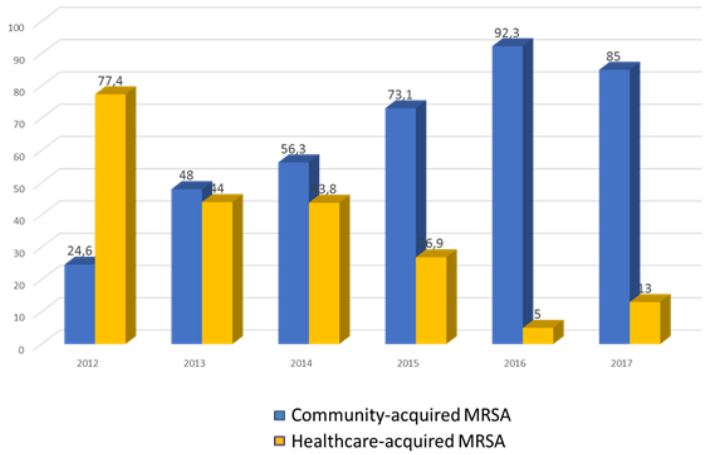

Figure 16: Proportion of community-acquired MRSA and healthcare-acquired MRSA in healthcare institutions in New Caledonia

The percentage of MRSA compared to that of S.aureus has increased exponentially since 2012. This problem concerns New Caledonia but not metropolitan France, which is seeing these figures drop.

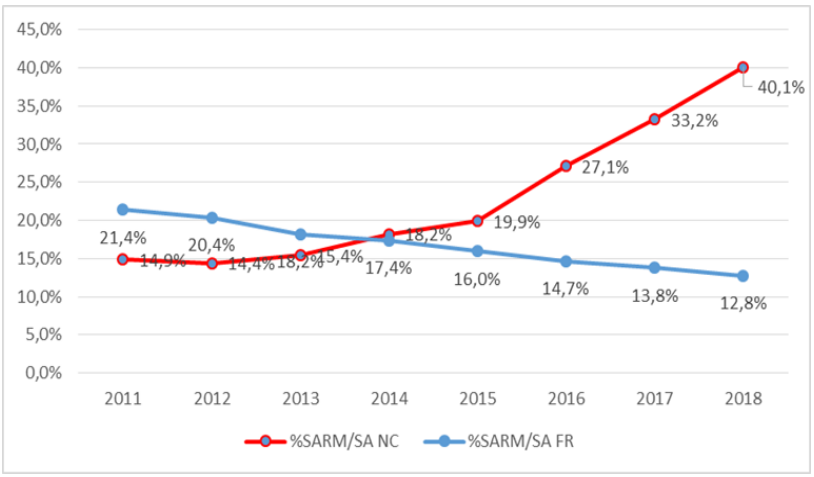

Figure 17: Percentage of MRSA in France and New Caledonia in healthcare institutions

On the other hand, this problem seems to be shared at the level of the South Pacific region.

Between 2001 and 2010, MRSA represented between 21 and 33.5% of S.aureus. This figure is lower than that of Papua New Guinea (27.2%) and that of the Samoa Islands (51%). Between 2011 and 2017, a bibliographic analysis listed between 44 and 81% of S.aureus tested for MRSA in Papua New Guinea, and 24% in the Samoa Islands, [23] when the figures put forward by the CHT Gaston-Bourret report levels resistances between 15 and 33% over this same period.

Molecular analyzes revealed that most MRSA (83.7%) also produced the Panton-Valentine toxin which made them virulent, in addition to being resistant. It turned out that most of these virulent MRSA also possessed resistance to fusidic acid: this forms a clonal complex, which is typical of New Caledonia.

This problem was not new in the Pacific region, since New Zealand had the same problem about ten years ago. [29] [30] [31]

By studying these SARMs at the genetic level, Australian researchers discovered that the gene for resistance to methicillin and fusidic acid are located on the same molecular element. Thus, the use of fusidic acid would select for fusidic acid-resistant strains, but also result in the co-selection of MRSA. [32]

This consumption was high in New Caledonia, almost twice as high as that of French Polynesia [33], an archipelago located 4600 km from New Caledonia, [34] benefiting from substantially the same environment, with the same climate [35] [36] and a similar number of inhabitants [37] [38].

In order to reduce the selection pressure on this New Caledonian clone, and thus to reduce the percentages of MRSA on the territory, the DASS-NC decided quickly to reduce the use of fusidic acid. After collegial advice from health professionals, it was decided in 2020 to completely withdraw fusidic acid from the market (see APPENDIX 14). Good practice recommendations for healthcare professionals accompanied this marketing suspension. (see APPENDIX 15)

The results obtained are very positive. The consumption of fusidic acid fell proportionally to the percentage of MRSA.

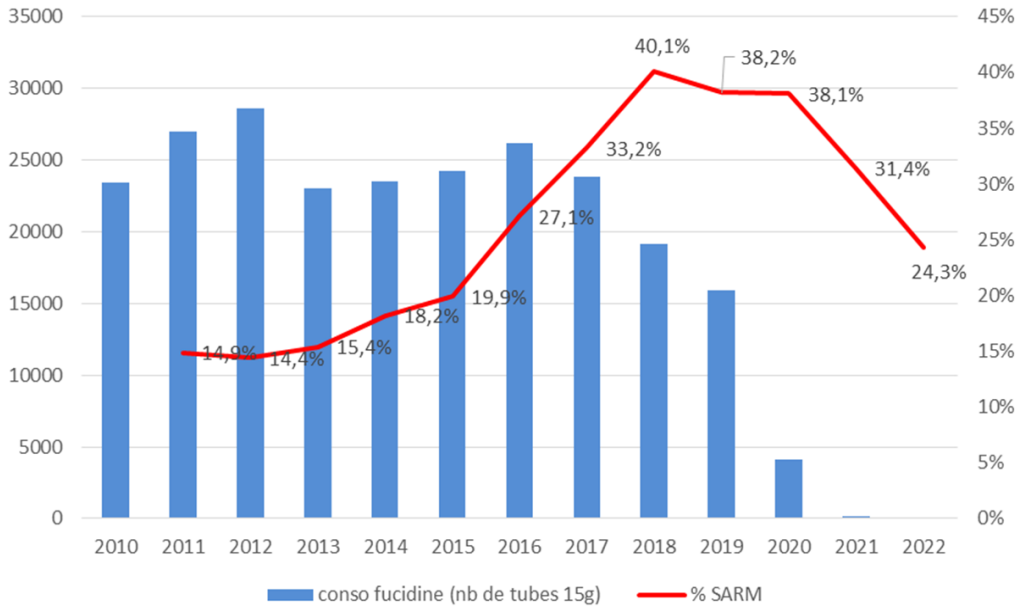

Figure 18: Percentage of MRSA and fusidic acid consumption (in units) in healthcare institutions

The risk of such a sudden replacement of this topical antibiotic is the massive transfer to other molecules, such as mupirocin. Since it is not tested in commercial antibiograms, the latest figures available are for the year 2019.

Case study: Emerging highly resistant bacteria (BHRe)

Emerging highly resistant bacteria (BHRe) are commensal bacteria of the digestive tract and resistant to many antibiotics. There are two main groups of (BHRe): vancomycin-resistant enterococci (ERG) and carbapenemase-producing enterobacteriaceae (EPC).

In general, the percentage of highly resistant bacteria is a good indicator of the level of control of the problem of antibiotic resistance at the scale of a country. [39]

Carbapenems are a class of beta-lactam antibiotics. This is the class that has the broadest spectrum of activity. Its use is exclusively hospital, and is used only to treat infections with multi-resistant bacteria. Carbapenemases are antibiotic-inactivating enzymes. It is a resistance mechanism that is transmissible and often associated with other resistance genes. This contributes to the appearance of multi or even toto-resistant strains. This represents a global health risk since these bacteria are present in many bacterial species, including in the environment. The first patient carrying this carbapenemase-resistant bacterium dates back to 2013. Today, nearly 150 patients are colonized or infected, with no travel history for the majority of patients. The plasmid responsible

for this resistance has been the same since its appearance, and was found to be of Australian origin. Two EPC outbreaks have occurred, in 2017 and 2018.
ERGs are the second class of BHRe. In New Caledonia, we are more specifically interested in VRE, enterococci resistant to vancomycin. If the first patient carrying this VRE was detected in 2011, it was not until 2015 that this became a major problem, with the appearance of an epidemic at the CHT.

Following an initial investigation by the DASS-NC in 2014 on "the investigation of BHRe cases within the CHT since 2011", as well as the results of the biological monitoring of the year 2014 by the IPNC, and observation of an increase in BHRe cases at the beginning of 2015, working meetings were organized by the DASS-NC and the CHT in order to take measures in a global and collaborative manner with the various partners of the local health and medico-social establishments.

The investigations made it possible to identify that these contaminations were mainly due to medically evacuated patients (EVASAN) returning from Australia, to environmental dissemination, and to cross-contamination.

Decisions taken by the CHT

The CHT made various arrangements as information became available. Thus, in 2012, systematic screening was set up for at-risk patients and in at-risk departments. In 2015 the first anti-infective guide adapted to the ecology of New Caledonia was developed; in 2016, the CHT set up cohorting, which consists of placing all patients wearing a BHR in a single department, subject to very strict hygiene rules. The CHT has also invested in devices to detect VRE more quickly, it has also set up e-mail alerts informing of the hospitalization of patients with BHRe. In 2019 he decided to set up systematic screening before the return of medical evacuees from Australia. Recently, a hospital practitioner was hired to develop inter-structure territorial software for monitoring BHREs.

Since the excessive and inappropriate use of antibiotics often puts selection pressure on bacteria, an audit on the proper use of carbapenems was commissioned in 2018, after the EPC epidemic. This revealed that good dispensing practices were respected in the majority of cases (78%). [40] [41]

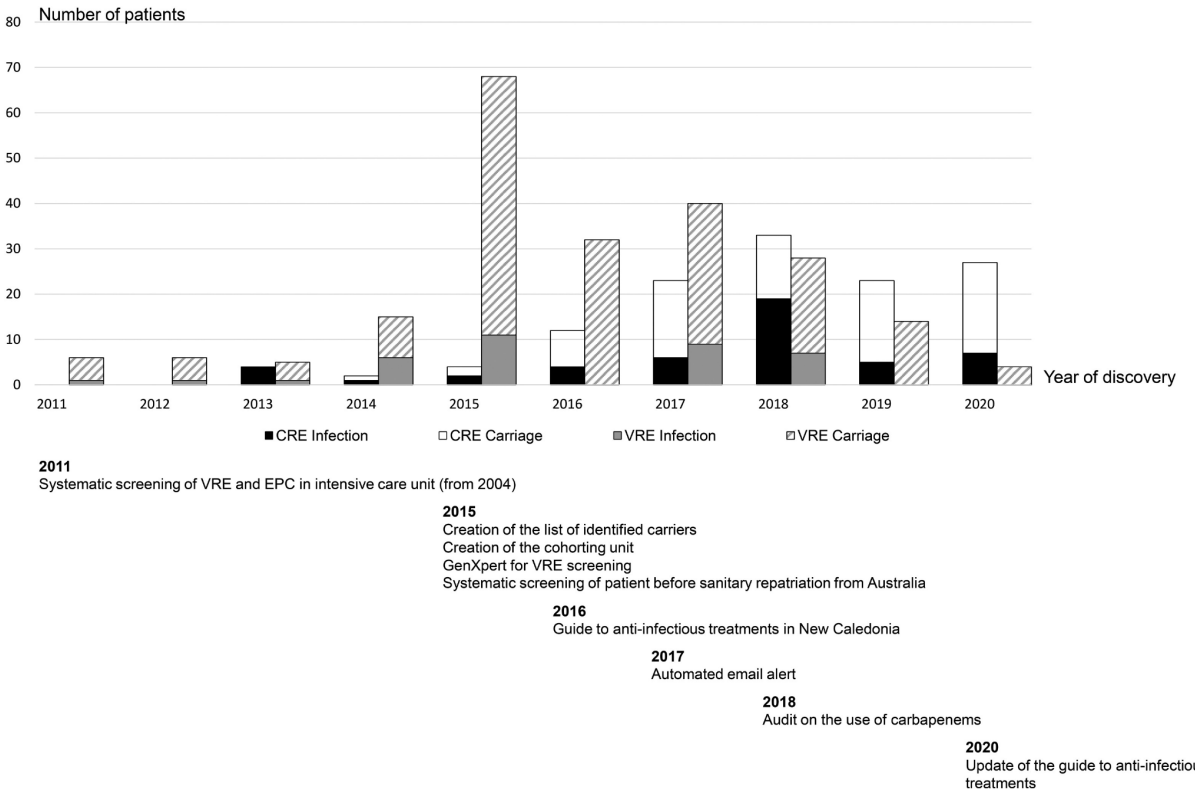

Figure 19: Number of CRE and VRE patients identified per year in New Caledonia with regard to implementation of an infection control program in CHT Gaston-Bourret

Decisions taken by the DASS-NC

A control plan for healthcare-associated infections and BMR/BHRe outbreaks proved to be essential, while the CHT was at that very time undergoing an outbreak of CPE. This work was carried out in partnership between different departments of the DASS: the health inspectorate, the pharmacy inspectorate and the public health service. It must make it possible to respond both to the legitimate requirements of quality and safety of care, but also to the process of seeking the efficiency of the health system and the optimization of the use of health resources in New Caledonia. It takes up the basic definitions and hygiene precautions but above all gives strategic axes and actions to be carried out at the territorial level. It is accompanied by operational technical sheets, such as: the action to be taken in the event of a fortuitous discovery, the admission of a patient with risk factors, how to control an epidemic, the prevention of dissemination in SSR, EHPAD and in the city.

In addition, the drafting of this plan highlighted the lack of data and exhaustiveness in the collection of information: IAS and BHRe are therefore categorized as notifiable diseases, and must be declared. systematically with the DASS-NC (see APPENDIX 16). This registration only concerns New Caledonia, the declaration is not mandatory in mainland France. [42] [43] In order to improve

the sharing of data between the different partners, a liaison form was also drawn up for patients with BHR and BMR (see APPENDIX 17) and contacts of BHR (see APPENDIX 18). At the same time, communication media have been created for these same patient populations (see APPENDICES 19 and 20).
The lack of visibility on the carrying of evacuated patients has led to the drafting of a procedure requiring the collection of the status vis-à-vis the carrying of BHRe before the departure and return of EVASAN patients to New Caledonia.

The educational aspect of health professionals is also taken into account, since a guide to anti-infective treatments relating to the ecology of New Caledonia was written in 2015: a new version, adapted to the progress of knowledge, was written in 2020.

DISCUSSION

First of all, this antibiotic resistance can be the result of a high consumption of antibiotics.
One hypothesis is that the prescription of antibiotics is too high and/or inappropriate: the resistance observed in the surgery department may be an indication of this. Nevertheless, the audit on good carbapenem prescribing practices revealed that most prescriptions were compliant. [44]
Another hypothesis is that this very high consumption of antibiotics is also due to a delay in treatment. Indeed, the Kanak community (39% of the total population) [45] is more inclined to turn primarily to traditional medicines rather than to modern Western medicine for many ailments, including wounds and infections. This leads to poorly treated infections and delays in care: when patients enter the traditional healthcare system, their condition is often degraded and requires more substantial antibiotic therapy. [46]
For the inhabitants of the North and Loyalty Provinces (70,000 people), the geographical distance from health centers can be a major obstacle to consulting a health professional, [47] and therefore delaying taking antibiotic therapy: Similarly, antibiotic therapy is more consistent when the patient finally goes to see a health professional.

In addition, the ecology of New Caledonia, similar to other islands in the South Pacific region, includes many zoonoses such as leptospirosis which are rampant in the territory, and become symptomatic when the disease is at an advanced stage. [48] In addition, the various STIs that circulate at higher rates in the territory compared to mainland France [49] also lead to antibiotic therapy (gonococcus, chlamydia, syphilis).

Other diseases, such as acute rheumatic fever or acute rheumatic heart disease, are present at high rates in the territory, and require antibiotic prophylaxis. These diseases have virtually disappeared in mainland France, [50] and are therefore even less well detected and treated by French doctors. [51]

We must also mention environmental contamination, which responds to resistance on large scales. The ARCANE project (Integrated environmental approach to antibiotic resistance via water analysis) developed in New Caledonia seeks to explore this resistance, by observing ESBL, EPC and Case HN. [52]

One of the interesting information that emerges from this study (still in progress) is the high percentage of resistance observed in E. coli at the exit of the CHT Gaston-Bourret is around 50%, with variations between 10 % and 90% of resistance found, depending on the sampling dates). By

way of comparison, the resistance found in hospital effluents is around 10% in mainland France. This raises questions about the effectiveness of water treatment at the exit of the largest hospital in the territory, and may be a way of answering the paradox of the high rate of resistance encountered in the CHT surgery department.

Concerning the abnormal rates of resistance and consumption of penicillins, they can be the result of an epidemic context, or even of a misuse of these antibiotics: a more thorough investigation is from now on necessary in order to examine in detail which classes of penicillins are mainly affected by this overconsumption, and this at a closer frequency. In addition, an audit of good practice in the dispensing of penicillins seems to be necessary in the surgery department, which could in particular be used to update the Guide to anti-infectives in New Caledonia.

CONCLUSION

Levels of antibiotic consumption and antibiotic resistance are higher in New Caledonia than in France. These data are not comparable with the other territories of the South Pacific. Furthermore, the levels of resistance seem to be positively correlated with the associated consumption rates.

The competent public health authorities have collectively and collaboratively developed solutions to defined resistance problems. These solutions have been measured and considered effective.

Aberrant data emerged from this inventory: these include the high consumption of penicillins in the surgery department. This issue would benefit from being explored in more detail, in order to understand these figures that come out of the trend curves.

There are also high levels of resistance to C3Gs and fluoroquinolones in the surgery department. Clarifications may be available following the results of projects carried out by local players, such as the ARCANE project studying antibiotic resistance in different aquatic environments.

These explanations can be found thanks to the strong commitment and close collaboration of the various public and private partners, which appears to be a major asset in this fight against antibiotic resistance.

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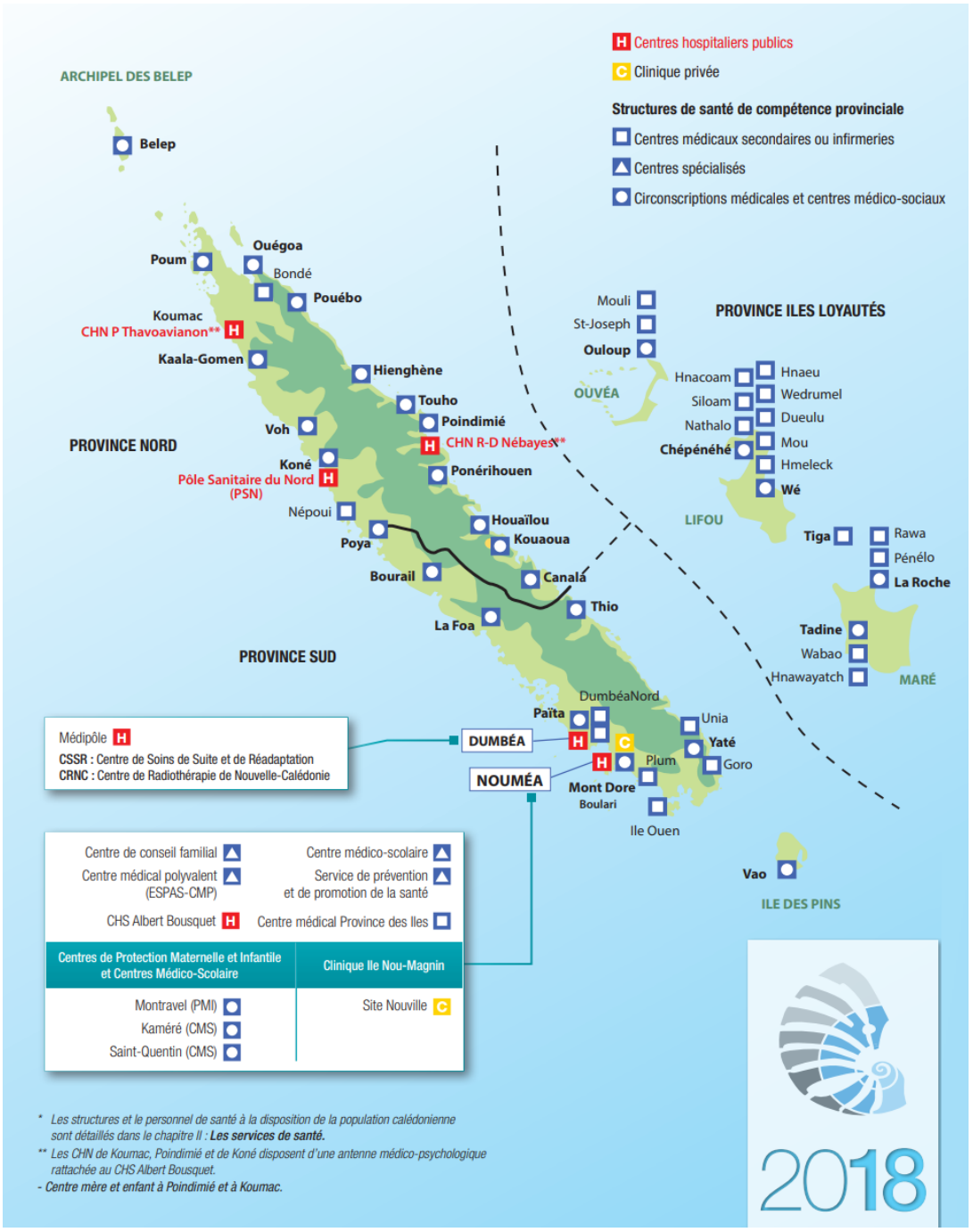


APPENDIX 2: Consumption of antibiotics in France in 2019 and 2020

Antimicrobial consumption in France, 2019

Data source

Health care	Data type	Coverage*	Data source (consumption)	Population (under surveillance)	Data source (population)
Community (primary care sector)	Sales	100%	Medicines Agency	67 020 703	National Statistics Agency
Hospital sector	Sales	100%	Medicines Agency	67 020 703	National Statistics Agency
Total care	Sales		Medicines Agency		National Statistics Agency

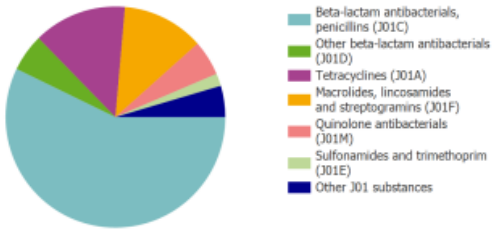
* Proportion of total country population under surveillance.

Antibacterials for systemic use (ATC group J01)

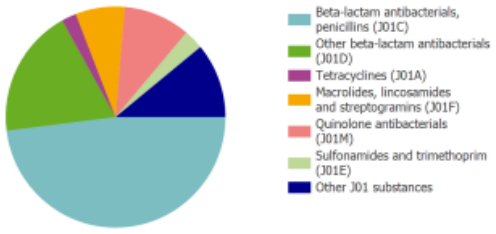
Consumption of antibacterials for systemic use (ATC group J01) in the community (primary care sector) and the hospital sector expressed in DDD per 1000 inhabitants and per day in 2019

ATC group J01	Community (primary care sector)	Hospital sector
Beta-lactam antibacterials, penicillins (J01C)	13.35	0.84
Other beta-lactam antibacterials (J01D)	1.28	0.33
Tetracyclines (J01A)	3.20	0.04
Macrolides, lincosamides and streptogramins (J01F)	2.81	0.13
Quinolone antibacterials (J01M)	1.21	0.17
Sulfonamides and trimethoprim (J01E)	0.43	0.05
Other J01 substances	1.07	0.19
Total	**23.34**	**1.74**

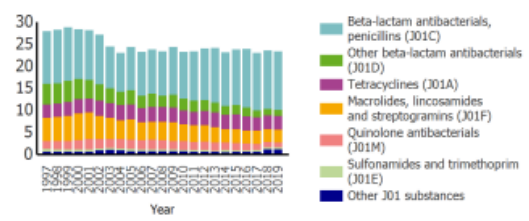
Distribution of the consumption in the community (primary care sector) of ATC group J01



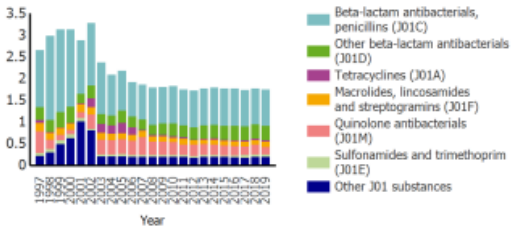
Distribution of the consumption in the hospital sector of ATC group J01



Trend of the consumption in the community (primary care sector) of ATC group J01 expressed in DDD per 1000 inhabitants and per day



Trend of the consumption in the hospital sector of ATC group J01 expressed in DDD per 1000 inhabitants and per day



This report has been generated from ESAC-Net data submitted to TESSy, The European Surveillance System on 2022-06-03. The report reflects the state of submissions in TESSy as of 2022-06-02 at 13:45

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Antimicrobial consumption in France, 2020

Data source

Health care	Data type	Coverage*	Data source (consumption)	Population (under surveillance)	Data source (population)
Community (primary care sector)	Sales	100%	Medicines Agency	67 235 472	National Statistics Agency
Hospital sector	Sales	100%	Medicines Agency	67 235 472	National Statistics Agency
Total care	Sales		Medicines Agency		National Statistics Agency

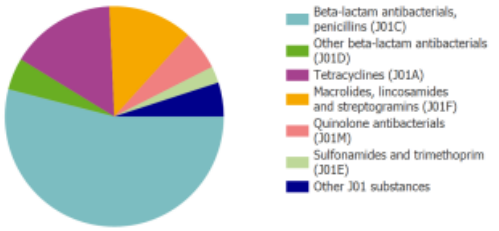
* Proportion of total country population under surveillance.

Antibacterials for systemic use (ATC group J01)

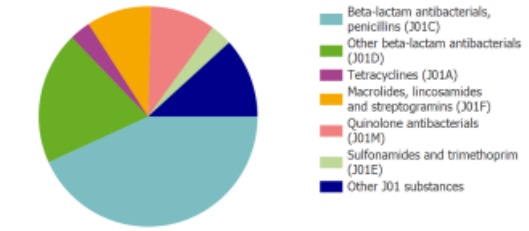
Consumption of antibacterials for systemic use (ATC group J01) in the community (primary care sector) and the hospital sector expressed in DDD per 1000 inhabitants and per day in 2020

ATC group J01	Community (primary care sector)	Hospital sector
Beta-lactam antibacterials, penicillins (J01C)	10.10	0.71
Other beta-lactam antibacterials (J01D)	0.88	0.32
Tetracyclines (J01A)	2.91	0.05
Macrolides, lincosamides and streptogramins (J01F)	2.34	0.16
Quinolone antibacterials (J01M)	1.09	0.16
Sulfonamides and trimethoprim (J01E)	0.46	0.05
Other J01 substances	0.93	0.19
Total	**18.70**	**1.64**

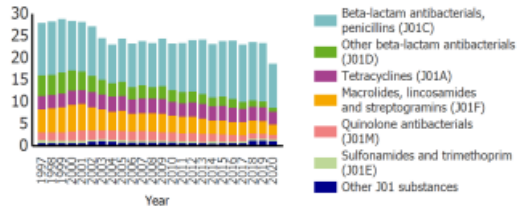
Distribution of the consumption in the community (primary care sector) of ATC group J01



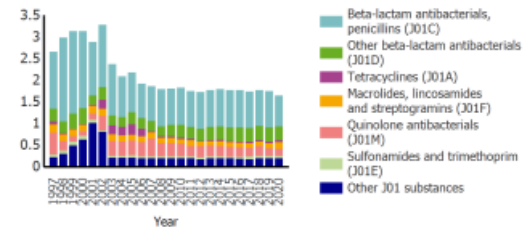
Distribution of the consumption in the hospital sector of ATC group J01



Trend of the consumption in the community (primary care sector) of ATC group J01 expressed in DDD per 1000 inhabitants and per day



Trend of the consumption in the hospital sector of ATC group J01 expressed in DDD per 1000 inhabitants and per day



This report has been generated from ESAC-Net data submitted to TESSy, The European Surveillance System on 2022-06-03. The report reflects the state of submissions in TESSy as of 2022-06-02 at 13:45

APPENDIX 3: Excel file to be sent to private medical biology laboratories

Communes	Nombre de souches d'*Escherichia Coli* isolées d'urines				Nombre de souches de *Klebsiella pneumoniae* isolées d'urines				Nombre de souches d'*E. Coli* résistantes aux C3G (Classe ATC J01DD) isolées d'urines			
	Année 2019	Année 2020	Année 2021	1er trimestre 2022	Année 2019	Année 2020	Année 2021	1er trimestre 2022	Année 2019	Année 2020	Année 2021	1er trimestre 2022
Belep												
Boulouparis												
Bourail												
Canala												
Dumbéa												
Farino												
Hienghène												
Houaïlou												
Ile des Pins												
Kaala-Gomen												
Koné												
Kouaoua												
Koumac												
La Foa												
Lifou												
Maré												
Moindou												
Mont-Dore												
Nouméa												
Ouégoa												
Ouégoa (Mairies annexes)												
Ouvéa												
Païta												
Poindimié												
Ponérihouen												
Pouébo												
Pouembout												
Poum												
Poya												
Sarraméa												
Thio												
Touho												
Voh												
Yaté												

N	O	P	Q	R	S	T	U
Nombre de souches d'*E. Coli* résistantes aux fluoroquinolones (Classe ATC J01MA) isolées d'urines				Nombre de souches d'*E.Coli*, *K. pneumoniae* et *E.cloacae* résistants aux carbapénèmes (Classe ATC J01DH) isolées d'urines			
Année 2019	Année 2020	Année 2021	1er trimestre 2022	Année 2019	Année 2020	Année 2021	1er trimestre 2022

APPENDIX 4 : E-mail sent to private medical biology laboratories

Les antibiotiques sont des médicaments qui servent à lutter contre les infections dues à des bactéries. C'est une des découvertes les plus importantes de la médecine qui sauve des millions de vies chaque année, mais leur efficacité est menacée car les bactéries peuvent s'adapter et résister au traitement. La surveillance épidémiologique de la résistance aux antibiotiques est un outil efficace visant à préserver notre capacité de prévenir et traiter les maladies infectieuses à l'aide de médicaments sûrs et efficaces.

Afin d'avoir un état des lieux exhaustif sur ces résistances, la DASS-NC vous demande de bien vouloir remplir le tableau Excel en pièce-jointe permettant de recenser le type et la proportion des souches bactériennes impliquées.

La corrélation de la consommation antibiotique et des résistances nous permettra de réaliser un rapport sur le phénomène de l'antibiorésistance en Nouvelle-Calédonie.

Ce rapport aura l'utilité double de faire avancer nos connaissances en matière de santé publique, mais permettra également à une étudiante de réaliser son mémoire de Master 2 sur le sujet.

Les données collectées seront confidentielles et s'inscrivent dans le Règlement (UE) 2016/679 du Parlement européen et du Conseil du 27 avril 2016 relatif à la protection des données confidentielles.

Merci par avance pour votre coopération.

APPENDIX 5: Excel file to be sent to CHT Gaston-Bourret

A destination de la pharmacie

Dénomination de l'établissement de santé					Année 2019	Nombre total de journée d'hospitalisation sur l'année concernée			
	Pédiatrie	Réanimation	Chirurgie	Gynécologie et Obstétrique	Médecine	Soins de longue durée	Psychiatrie	Autres	TOTAL
J01A Tétracyclines									
J01B Phénicolés									
J01C Bétalactamines Pénicillines									
J01D Autres bétalactamines									
J01E Sulfamides/ Triméthoprime									
J01F Macrolides, lincosamides et streptogramines									
J01G Aminosides antibactériens									
J01M Quinolones antibactériennes									
J01R Associations d'antibactériens									
Total									
J04AB02 Rifampicine									
P01AB Imidazolés per os									
A07AA12 Fidaxomycine									
Nombre d'EVASAN vers l'Australie									

Dénomination de l'établissement de santé					Année 2020	Nombre total de journée d'hospitalisation sur l'année concernée			
	Pédiatrie	Réanimation	Chirurgie	Gynécologie et Obstétrique	Médecine	Soins de longue durée	Psychiatrie	Autres	TOTAL
J01A Tétracyclines									
J01B Phénicolés									
J01C Bétalactamines Pénicillines									
J01D Autres bétalactamines									
J01E Sulfamides/ Triméthoprime									
J01F Macrolides, lincosamides et streptogramines									
J01G Aminosides antibactériens									
J01M Quinolones antibactériennes									
J01R Associations d'antibactériens									
Total									
J04AB02 Rifampicine									
P01AB Imidazolés per os									
A07AA12 Fidaxomycine									
Nombre d'EVASAN vers l'Australie									

J01A Tétracyclines
J01B Phénicolés
J01C Bétalactamines Pénicillines
J01D Autres bétalactamines
J01E Sulfamides/ Triméthoprime
J01F Macrolides, lincosamides et streptogramines
J01G Aminosides antibactériens
J01M Quinolones antibactériennes
J01R Associations d'antibactériens
Total
J04AB02 Rifampicine
P01AB Imidazolés per os
A07AA12 Fidaxomycine
Nombre d'EVASAN vers l'Australie

Année 2019	Pédiatrie	Réanimation	Chirurgie	Gynécologie et Obstétrique	Médecine	Soins de longue durée	Psychiatrie	Autres	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures									
Nombre de souches de *S.aureus* isolées de pus superficiel									
Nombre de souches de *S.aureus cxs-R* isolées d'hémocultures									
Nombre de souches de *S.aureus cxs-R* isolées de pus superficiel									
Nombre de souches d'*E. faecium* isolées d'hémocultures									
Nombre de souches d' *E.faecium vanco-R* isolées d'hémocultures									
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)									
Nombre de souches de *K.pneumoniae* isolées d'hémocultures									
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures									
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)									

A destination du laboratoire

APPENDIX 6: Excel file to be sent to CHS Albert-Bousquet

Dénomination de l'établissement de santé	Année	Nombre total de journées d'hospitalisation sur l'année concernée
CHS Albert-Bousquet	2019	
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'établissement de santé	Année	Nombre total de journées d'hospitalisation sur l'année concernée
CHS Albert-Bousquet	2020	
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'établissement de santé	Année	Nombre total de journées d'hospitalisation sur l'année concernée
CHS Albert-Bousquet	2021	
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'établissement de santé	Année	Nombre total de journées d'hospitalisation sur l'année concernée
CHS Albert-Bousquet	1er trimestre 2022	
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Année 2019	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches d'*E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

Année 2020	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches d'*E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

Année 2021	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches d'*E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

1er trimestre 2022	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches d'*E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

APPENDIX 7 : Excel file to be completed sent to the Aftercare and Rehabilitation Center (CSSR)

A destination de la pharmacie

Dénomination de l'établissement de santé	Année	Nombre total de journées d'hospitalisation sur l'année concernée
Centre de Soins de Suite et de Réadaptation	2019	.....
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'établissement de santé	Année	Nombre total de journées d'hospitalisation sur l'année concernée
Centre de Soins de Suite et de Réadaptation	2020	.....
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'établissement de santé	Année
Centre de Soins de Suite et de Réadaptation	2021
J01A: Tétracyclines	
J01B Phénicolés	
J01C: Bêtalactamines pénicillines	
J01D: Autres bêtalactamines	
J01E: Sulfamides/Triméthoprime	
J01F: Macrolides, lincosamides et streptogramines	
J01G: Aminosides antibactériens	
J01M: Quinolones antibactériennes	
J01R: Associations d'antibactériens	
Total	

A destination du laboratoire

Année 2019	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches *d'E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

Année 2020	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches *d'E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

Année 2021	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches *d'E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

Année 2022 (1er trimestre)	TOTAL
Nombre de souches de *S.aureus* isolées d'hémocultures	
Nombre de souches de *S.aureus* isolées de pus superficiel	
Nombre de souches de *S.aureus oxa-R* isolées d'hémocultures	
Nombre de souches de *S.aureus oxa-R* isolées de pus superficiel	
Nombre de souches *d'E. faecium* isolées d'hémocultures	
Nombre de souches d'*E.faecium vanco-R* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistants aux C3G (Classe ATC J01DD)	
Nombre de souches de *K.pneumoniae* isolées d'hémocultures	
Nombre de souches de *K.pneumoniae* résistantes aux carbapénèmes (Classe ATC J01DH) isolées d'hémocultures	
Nombre d'entérobactéries résistantes aux carbapénèmes (Classe ATC J01DH)	

APPENDIX 8: Email sent to the 3 health establishments: CHT Gaston-Bourret, Aftercare and Rehabilitation Center (CSSR), CHS Albert-Bousquet

Les antibiotiques sont des médicaments qui servent à lutter contre les infections dues à des bactéries. C'est une des découvertes les plus importantes de la médecine qui sauve des millions de vies chaque année, mais leur efficacité est menacée car les bactéries peuvent s'adapter et résister au traitement. La surveillance de la consommation des antibiotiques en établissement de santé contribue à la politique sanitaire de maîtrise de l'antibiorésistance en promouvant le bon usage des antibiotiques.

Afin d'avoir un état des lieux exhaustif sur cette consommation, la DASS-NC vous demande de bien vouloir renseigner la consommation d'antibiotiques par année depuis 2019 en fonction des classes ATC, comme indiqué dans le tableau ci-joint (onglet « Pharmacie »). Les données seront renseignées préférentiellement en DDJ ou DDJ/1000 JH, mais peuvent également être données en UCD au besoin. Si jamais vous n'arriviez pas à identifier les antibiotiques au moyen des classes ATC, il vous est possible de retrouver les anti-infectieux grâce aux codes CIP disponibles dans le document Excel ci-joint.

L'onglet « Laboratoire » permet quant à lui de recenser le type et la proportion des souches résistantes. Le laboratoire de biologie médicale de votre établissement de santé pourra renseigner ces données.

La corrélation de la consommation antibiotique et des résistances nous permettra de réaliser un rapport sur le phénomène de l'antibiorésistance en Nouvelle-Calédonie.

Ce rapport sera de double utilité : faire avancer nos connaissances en matière d'antibiorésistance et donc d'actions de santé publique à mener, mais permettra également à une étudiante de réaliser son mémoire de Master 2 sur le sujet.

Les données collectées seront confidentielles et s'inscrivent dans le Règlement (UE) 2016/679 du Parlement européen et du Conseil du 27 avril 2016 relatif à la protection des données confidentielles.

Merci par avance.

APPENDIX 9: Excel file sent to EHPAD coordinating doctors

Année 2019	TOTAL		Année 2020	TOTAL		Année 2021	TOTAL		1er trimestre 2022	TOTAL
Nombre de souches d'*Escherichia Coli* isolées d'urines			Nombre de souches d'*Escherichia Coli* isolées d'urines			Nombre de souches d'*Escherichia Coli* isolées d'urines			Nombre de souches d'*Escherichia Coli* isolées d'urines	
Nombre de souches d'*E. Coli* résistantes aux C3G (Classe ATC J01DD) isolées d'urines			Nombre de souches d'*E. Coli* résistantes aux C3G (Classe ATC J01DD) isolées d'urines			Nombre de souches d'*E. Coli* résistantes aux C3G (Classe ATC J01DD) isolées d'urines			Nombre de souches d'*E. Coli* résistantes aux C3G (Classe ATC J01DD) isolées d'urines	
Nombre de souches d'*E. Coli* résistantes aux fluoroquinolones (Classe ATC J01MA) isolées d'urines			Nombre de souches d'*E. Coli* résistantes aux fluoroquinolones (Classe ATC J01MA) isolées d'urines			Nombre de souches d'*E. Coli* résistantes aux fluoroquinolones (Classe ATC J01MA) isolées d'urines			Nombre de souches d'*E. Coli* résistantes aux fluoroquinolones (Classe ATC J01MA) isolées d'urines	
Nombre de souches d'*E.Coli, K. pneumoniae* et *E.cloacae* résistants aux carbapénèmes (Classe ATC J01DH) isolées d'urines			Nombre de souches d'*E.Coli, K. pneumoniae* et *E.cloacae* résistants aux carbapénèmes (Classe ATC J01DH) isolées d'urines			Nombre de souches d'*E.Coli, K. pneumoniae* et *E.cloacae* résistants aux carbapénèmes (Classe ATC J01DH) isolées d'urines			Nombre de souches d'*E.Coli, K. pneumoniae* et *E.cloacae* résistants aux carbapénèmes (Classe ATC J01DH) isolées d'urines	

APPENDIX 10: E-mail sent to the coordinating doctors of EHPADs

A l'attention des médecins coordonnateurs,

Les antibiotiques sont des médicaments qui servent à lutter contre les infections dues à des bactéries. C'est une des découvertes les plus importantes de la médecine qui sauve des millions de vies chaque année, mais leur efficacité est menacée car les bactéries peuvent s'adapter et résister au traitement. La surveillance épidémiologique de la résistance aux antibiotiques est un outil efficace visant à préserver notre capacité de prévenir et traiter les maladies infectieuses à l'aide de médicaments sûrs et efficaces.

Afin d'avoir un état des lieux exhaustif sur ces résistances, la DASS-NC vous demande de bien vouloir remplir le tableau Excel en pièce-jointe permettant de recenser le type et la proportion des souches bactériennes impliquées. Ces données peuvent être obtenues grâces aux analyses demandées par vos soins aux PUI et laboratoires de biologie médicale.

La corrélation de la consommation antibiotique et des résistances nous permettra de réaliser un rapport sur le phénomène de l'antibiorésistance en Nouvelle-Calédonie.

Ce rapport aura l'utilité double de faire avancer nos connaissances en matière de santé publique, mais permettra également à une étudiante de réaliser son mémoire de Master 2 sur le sujet.

Nous avons bien conscience de la quantité supplémentaire de travail que nous vous demandons, mais ces données nous sont absolument indispensables pour avoir un état des lieux de ces résistances en EHPAD.

Les données collectées seront confidentielles et s'inscrivent dans le Règlement (UE) 2016/679 du Parlement européen et du Conseil du 27 avril 2016 relatif à la protection des données confidentielles.

Merci par avance pour votre coopération.

APPENDIX 11: Excel file sent to pharmaceutical wholesalers in New Caledonia

Dénomination de l'officine	Année 2019	Nombre total de journées d'hospitalisation sur l'année concernée .....
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'officine	Année 2020	Nombre total de journées d'hospitalisation sur l'année concernée .....
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'officine	Année 2021	Nombre total de journées d'hospitalisation sur l'année concernée .....
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

Dénomination de l'officine	Année 1er trimestre 2022	Nombre total de journées d'hospitalisation sur l'année concernée .....
J01A: Tétracyclines		
J01B Phénicolés		
J01C: Bêtalactamines pénicillines		
J01D: Autres bêtalactamines		
J01E: Sulfamides/Triméthoprime		
J01F: Macrolides, lincosamides et streptogramines		
J01G: Aminosides antibactériens		
J01M: Quinolones antibactériennes		
J01R: Associations d'antibactériens		
Total		

APPENDIX 12: Email sent to pharmaceutical wholesalers in New Caledonia

Bonjour,

Les antibiotiques sont des médicaments qui servent à lutter contre les infections dues à des bactéries. C'est une des découvertes les plus importantes de la médecine qui sauve des millions de vies chaque année, mais leur efficacité est menacée car les bactéries peuvent s'adapter et résister au traitement. La surveillance de la consommation des antibiotiques en établissement de santé contribue à la politique sanitaire de maîtrise de l'antibiorésistance en promouvant le bon usage des antibiotiques.

Afin d'avoir un état des lieux exhaustif sur cette consommation, la DASS-NC vous demande de bien vouloir renseigner la consommation d'antibiotiques par année depuis 2019 en fonction des classes ATC. Les données seront renseignées préférentiellement en DDJ ou DDJ/1000 JH, mais peuvent également être données en nombre de boîtes au besoin. Si jamais vous n'arriviez pas à identifier les antibiotiques au moyen des classes ATC, il vous est possible de retrouver les anti-infectieux grâce aux codes CIP disponibles dans le document Excel ci-joint. Comme expliqué par téléphone, ce tableau inclut tous les codes CIP des médicaments concernés y compris les génériques.

La corrélation de la consommation antibiotique et des résistances nous permettra de réaliser un rapport sur le phénomène de l'antibiorésistance en Nouvelle-Calédonie. Il est important de renseigner les données par pharmacie afin qu'un travail de cartographie puisse être réalisé.

Ce rapport sera de double utilité : faire avancer nos connaissances en matière d'antibiorésistance et donc d'actions de santé publique à mener, mais permettra également à une étudiante de réaliser son mémoire de Master 2 sur le sujet.

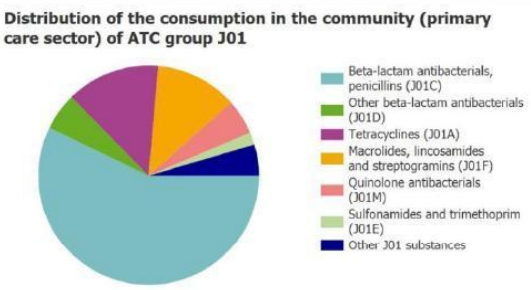
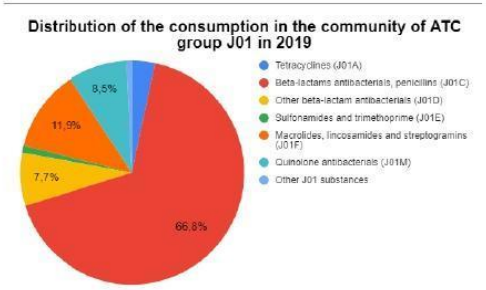
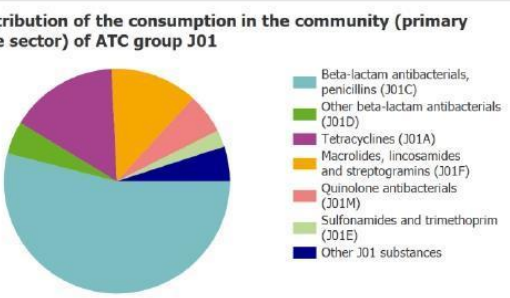
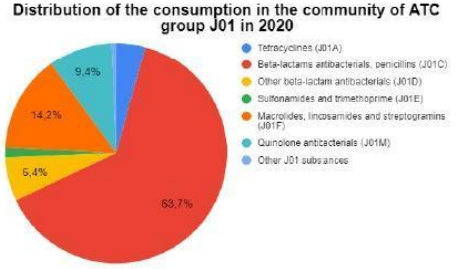
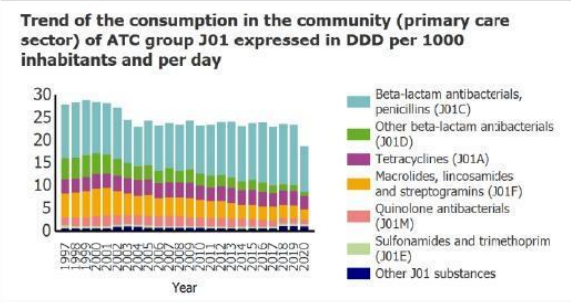
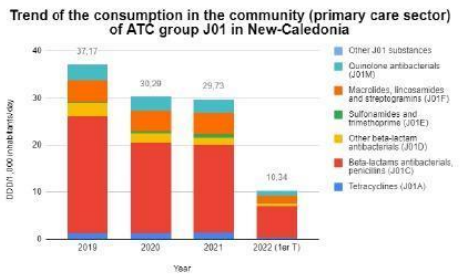
Les données collectées seront confidentielles et s'inscrivent dans le Règlement (UE) 2016/679 du Parlement européen et du Conseil du 27 avril 2016 relatif à la protection des données confidentielles.

Un retour est attendu pour le 12 avril 2022.

Merci pour votre collaboration.

Bien cordialement

APPENDIX 13: Comparison of antibiotic consumption data between New Caledonia and France

	Antimicrobial consumption in France	Antimicrobial consumption in New Caledonia
2019		
2020		
Consumption over time		

APPENDIX 14: Deliberation on the suspension of the marketing of fusidic acid in New Caledonia

Vu l'arrêté n° 2019-8276/GNC-Pr du 5 juillet 2019 constatant la prise de fonctions du président du gouvernement de la Nouvelle-Calédonie ;

Vu l'arrêté n° 2019-8440/GNC-Pr du 9 juillet 2019 constatant la prise de fonctions du vice-président du gouvernement de la Nouvelle-Calédonie ;

Vu le dossier adressé par Mme Estelle Bui, cheffe de département du centre médico-sociale de la Cafat et Mme le Dr. Agnés Lepot, biologiste du laboratoire d'analyse de biologie médicale de la Cafat, reçu complet le 18 janvier 2021, en vue d'obtenir l'autorisation de transfert et d'ouverture du laboratoire d'analyse de biologie médicale actuellement depuis le 5 rue Henri Dunant au Receiving vers le 6 rue Eugène Levesque à la Rivière Salée, commune de Nouméa ;

Vu l'avis du conseil de l'ordre des pharmaciens de la Nouvelle-Calédonie en date du 21 janvier 2021;

Sur proposition du directeur des affaires sanitaires et sociales de la Nouvelle-Calédonie,

Arrête :

Article 1er : Est autorisée le transfert et l'ouverture du laboratoire d'analyses de biologie médicale de la Cafat au 6 rue Eugène Levesque à la Rivière Salée, commune de Nouméa :

Directrice : Mme Agnès Lepot, pharmacien biologiste.

Catégories d'analyses de biologie médicale pratiquées :

- hématologie : cytologie, hémostase coagulation, immuno-hématologie ;
- microbiologie : bactériologie, parasitologie, mycologie ;
- immunologie : allergie, auto-immunité, sérologie bactérienne, sérologie parasitaire, sérologie virale ;
- hormonologie ;
- enzymologie ;
- protéines – marqueurs tumoraux – vitamines ;
- biochimie : sanguine, urinaire, liquide de ponction, épreuves fonctionnelles.

Article 2 : Le présent arrêté sera notifié aux intéressées, transmis au haut-commissaire de la République en Nouvelle-Calédonie et publié au *Journal officiel* de la Nouvelle-Calédonie.

Le président du gouvernement de la Nouvelle-Calédonie,
THIERRY SANTA

Le membre du gouvernement chargé de la coordination et de la mise en œuvre du plan Do Kamo, du service civique, et de la condition féminine
VALENTINE EURISOUKE

Arrêté n° 2021-365/GNC du 23 février 2021 portant suspension d'autorisations de mise sur le marché de médicaments à base d'acide fusidique et fusidate sodique par voie topique

Le gouvernement de la Nouvelle-Calédonie,

Vu la loi organique modifiée n° 99-209 du 19 mars 1999 relative à la Nouvelle-Calédonie ;

Vu la loi modifiée n° 99-210 du 19 mars 1999 relative à la Nouvelle-Calédonie ;

Vu le code de la santé publique dans sa version applicable à la Nouvelle-Calédonie, livre V, notamment les articles Lp. 5121-7 et Lp. 5121-10 ;

Vu la délibération n° 4 du 5 juin 2019 fixant le nombre de membres du gouvernement de la Nouvelle-Calédonie ;

Vu la délibération modifiée n° 2019-91D/GNC du 9 juillet 2019 chargeant les membres du gouvernement de la Nouvelle-Calédonie d'une mission d'animation et de contrôle d'un secteur de l'administration ;

Vu l'arrêté n° 2019-8270/GNC-Pr du 5 juillet 2019 constatant la prise de fonctions des membres du gouvernement de la Nouvelle-Calédonie ;

Vu l'arrêté n° 2019-8276/GNC-Pr du 5 juillet 2019 constatant la prise de fonctions du président du gouvernement de la Nouvelle-Calédonie ;

Vu l'arrêté n° 2019-8440/GNC-Pr du 9 juillet 2019 constatant la prise de fonctions du vice-président du gouvernement de la Nouvelle-Calédonie ;

Vu les autorisations de mises sur le marché (AMM) octroyées aux médicaments à base d'acide fusidique et de fusidate sodique ;

Vu l'avis consensuel du comité de prévention des infections associées aux soins en date du 3 juin 2020 ;

Considérant que l'antibiorésistance est un grave problème de santé publique mondial, qui progresse extrêmement rapidement, et qui s'accélère depuis les années 2000 ;

Considérant que l'organisation mondiale de la santé accorde une grande priorité à la lutte contre la résistance aux antibiotiques et demande l'optimisation de l'usage des antimicrobiens et engage les autorités de santé à réglementer et à favoriser l'usage rationnel et la mise à disposition de médicaments de qualité ;

Considérant l'augmentation significative de la circulation du staphylocoque doré résistant à la méticilline (SARM) en Nouvelle-Calédonie depuis 2014, alors même que sa présence infléchit ailleurs de par le monde : en 2018, 40.1% de SARM en Nouvelle-Calédonie contre 12.8% en France ;

Considérant la forte consommation d'acide fusidique et de fusidate sodique par voie topique en Nouvelle-Calédonie : 1.6 fois plus qu'en France et 2 fois plus qu'en Polynésie française ;

Considérant les résultats de l'étude SARMPac menée en 2019 qui a examiné le SARM dans la Pacifique et qui conclut à la mise en évidence d'un clone de SARM spécifique à la Nouvelle-Calédonie : résistant à plus de 70% à l'acide fusidique et porteur de la toxique PVL (Leucocidine de Panton-Valentine) ;

Considérant que ce clone est présent sur l'ensemble du territoire de la Nouvelle-Calédonie ;

Considérant qu'une étude Néo-Zélandaise conclut que l'utilisation d'acide fusidique par voie topique engendre la sélection du SARM ;

Considérant que la sortie de l'arsenal thérapeutique des spécialités concernées n'est pas de nature à occasionner une perte de chance pour les patients et animaux et que la suspension de l'utilisation d'un antibiotique permet de retrouver une sensibilité microbienne au bout de plusieurs années, associée au renforcement des mesures d'hygiène ;

Considérant aux termes de l'article Lp. 5121-10 du code de la santé publique dans sa version applicable à la Nouvelle-Calédonie, l'AMM peut être retirée notamment lorsque l'évaluation des effets thérapeutiques positifs du médicament au regard des risques pour la santé du patient ou la santé publique liés à sa qualité, sa sécurité ou son efficacité n'est pas considérée comme favorable ;

Considérant qu'il y a donc lieu, au vu de l'ensemble des éléments précités de suspendre les AMM des médicaments à base d'acide fusidique ou de fusidate sodique, jusqu'à ce que soient satisfaites les conditions ;

Sur proposition de la directrice par intérim des affaires sanitaires et sociales de la Nouvelle-Calédonie,

Arrête :

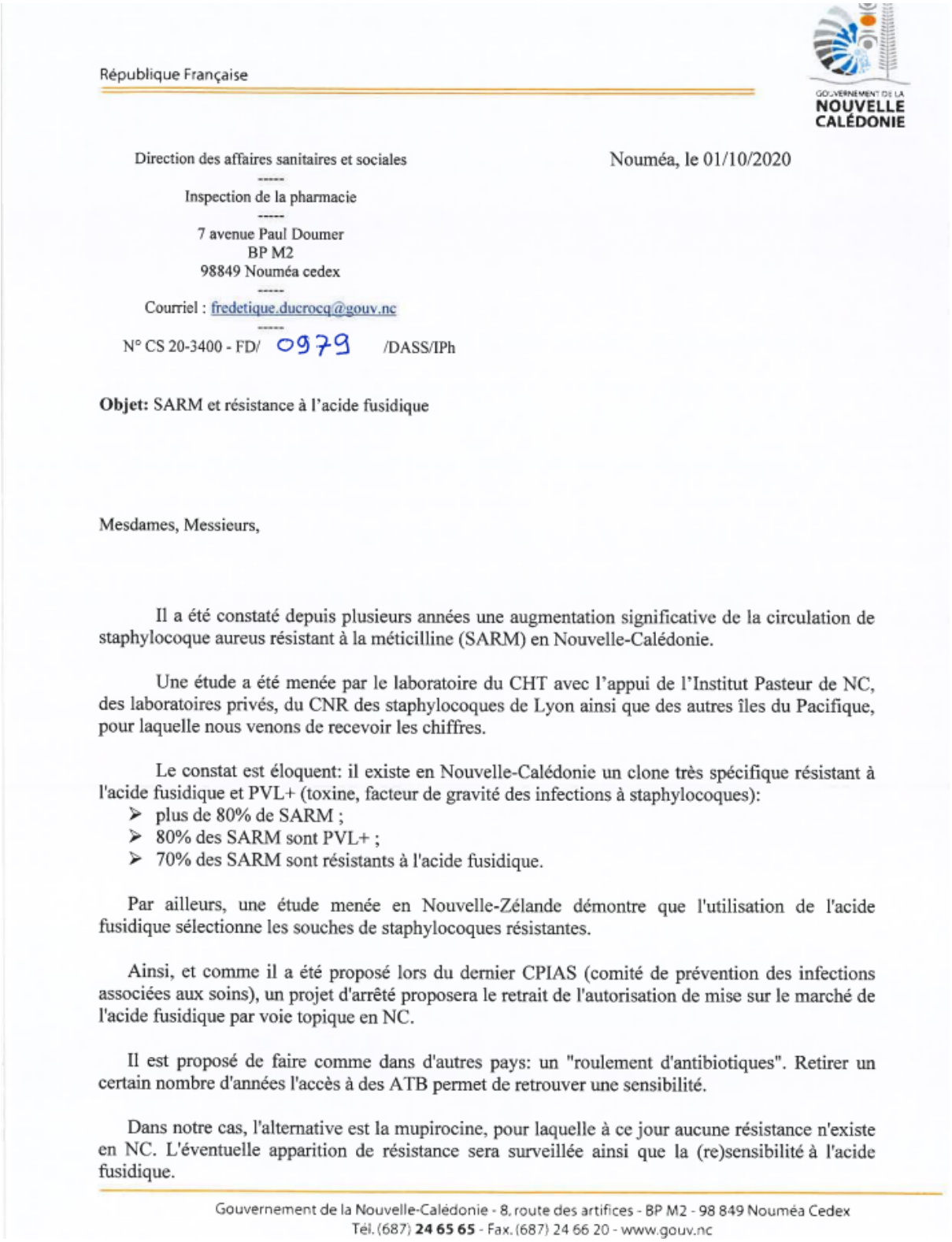
Article 1er : Les autorisations de mise sur le marché des médicaments à usage humain et vétérinaire à base d'acide fusidique ou de fusidate sodique par voie topique, sont suspendues.

Article 2 : Le présent arrêté sera notifié aux intéressés, transmis au haut-commissaire de la République en Nouvelle-Calédonie et publié au *Journal officiel* de la Nouvelle-Calédonie.

Le président du gouvernement de la Nouvelle-Calédonie,
THIERRY SANTA

Le membre du gouvernement chargé de la coordination et de la mise en œuvre du plan Do Kamo, du service civique, et de la condition féminine
VALENTINE EURISOUKE

APPENDIX 15: Letter relating to the ban on the sale of fusidic acid by pharmacies in New Caledonia



République Française

GOUVERNEMENT DE LA NOUVELLE CALÉDONIE

Direction des affaires sanitaires et sociales

Inspection de la pharmacie
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7 avenue Paul Doumer
BP M2
98849 Nouméa cedex

Courriel : fredetique.ducrocq@gouv.nc

Nouméa, le 01/10/2020

N° CS 20-3400 - FD/ 0979 /DASS/IPh

Objet: SARM et résistance à l'acide fusidique

Mesdames, Messieurs,

Il a été constaté depuis plusieurs années une augmentation significative de la circulation de staphylocoque aureus résistant à la méticilline (SARM) en Nouvelle-Calédonie.

Une étude a été menée par le laboratoire du CHT avec l'appui de l'Institut Pasteur de NC, des laboratoires privés, du CNR des staphylocoques de Lyon ainsi que des autres îles du Pacifique, pour laquelle nous venons de recevoir les chiffres.

Le constat est éloquent: il existe en Nouvelle-Calédonie un clone très spécifique résistant à l'acide fusidique et PVL+ (toxine, facteur de gravité des infections à staphylocoques):

- plus de 80% de SARM ;
- 80% des SARM sont PVL+ ;
- 70% des SARM sont résistants à l'acide fusidique.

Par ailleurs, une étude menée en Nouvelle-Zélande démontre que l'utilisation de l'acide fusidique sélectionne les souches de staphylocoques résistantes.

Ainsi, et comme il a été proposé lors du dernier CPIAS (comité de prévention des infections associées aux soins), un projet d'arrêté proposera le retrait de l'autorisation de mise sur le marché de l'acide fusidique par voie topique en NC.

Il est proposé de faire comme dans d'autres pays: un "roulement d'antibiotiques". Retirer un certain nombre d'années l'accès à des ATB permet de retrouver une sensibilité.

Dans notre cas, l'alternative est la mupirocine, pour laquelle à ce jour aucune résistance n'existe en NC. L'éventuelle apparition de résistance sera surveillée ainsi que la (re)sensibilité à l'acide fusidique.

Par conséquent, il vous est demandé de cesser l'achat en direct d'acide fusidique (pommade et crème), l'arrêté sera pris de manière à laisser le temps d'écouler les stocks actuels. Les grossistes-répartiteurs ont également été informés.

Mes services restent disponibles pour tout complément.

Je vous prie d'agréer, mesdames, messieurs, l'expression de ma parfaite considération.

La directrice par interim des affaires sanitaires et sociales
de la Nouvelle-Calédonie

Séverine METILLON

Destinataires :
pharmaciens d'officine
pharmaciens des Provinces
pharmaciens des établissements de santé

APPENDIX 16: Notifiable disease declaration form - Healthcare-associated infections and BHRe

Personne responsable de la déclaration
Nom :
Fonction :
Etablissement / service :
Adresse :
Tel : Email :
Signature :

DASS
Direction des Affaires Sanitaires et Sociales

Infections associées aux soins et BHRe

IMPORTANT : cette fiche peut être utilisée pour notifier les cas isolés et les cas groupés. Elle doit être complétée par le déclarant en fonction des informations dont il dispose au moment de la notification et par la DASS-NC en fonction des données de l'enquête effectuée.

Nom : Prénom : Sexe : M ☐ F ☐ Date de naissance *(jj/mm/aaaa)* :
Adresse : Téléphone : Commune domicile :
Date de déclaration :

Service(s) concerné(s) (précisez le service de découverte si BHRe) :
Etablissement :

1) Critères de signalement (à cocher obligatoirement, une ou plusieurs cases)

☐ **1. Colonisation/ Infection à BHRe**
2. Infection associée aux soins ayant un caractère particulier du fait :
- ☐ **2.a.** De l'agent pathogène en cause (nature, caractéristiques ou profil de résistance)
- ☐ **2.b.** De la localisation de l'infection
- ☐ **2.c.** De l'utilisation d'un dispositif médical (DM), lequel :
- ☐ **2.d.** De procédures ou pratiques pouvant exposer ou avoir exposé d'autres personnes au même risque infectieux, lors d'un acte invasif. Précisez lesquelles :

☐ **3. Décès lié à une infection associée aux soins**
☐ **4. Infection associée aux soins suspecte d'être causée par un germe présent dans l'eau ou dans l'air environnant**
☐ **5. Maladie devant faire l'objet d'une Déclaration obligatoire et dont l'origine nosocomiale peut être suspectée**
☐ **6. Autre (épidémie par exemple), précisez :**

2) Description de l'évènement

Evènement n°
Cet évènement se rapporte-t-il à un évènement déjà signalé ? ☐ Non ☐ Oui Si oui, date du signalement :

Autour du cas :

- Date d'entrée dans l'établissement :
- Date de l'alerte :
- Circonstances de découverte : (renseigner précisément le contexte si dépistage BHRe)

- Cas groupés ou épidémies : ☐ Non ☐ Oui
- Type de cas : ☐ Infection ☐ Colonisation
- Population concernée : ☐ Patient(s) ☐ Personnel(s)
- Caractère nosocomial : ☐ Certain ☐ Probable ☐ Possible
- Origine du cas : ☐ Acquis dans l'établissement ☐ Importé
  - Autres établissements concernés : ☐ Non ☐ Oui Si oui, le(s)quel(s) :

- Site(s) anatomique(s) / type de prélèvement (précisez si DM en culture) :

- Micro-organisme en cause : ☐ BMR ☐ BHRe
  - Profil de résistance (joindre l'antibiogramme si besoin, notamment si critère 2.a.)

Maladie à déclaration obligatoire (délibération 423 du 26 novembre 2008) – Cette fiche fait l'objet d'un traitement informatique automatisé déclaré à la CNIL.

Si BHRe :

- Date du prélèvement positif :
- Patient dépendant/semi-dépendant : ◘ Non ◘ Oui Précisez :
- Incontinence fécale : ◘ Non ◘ Oui Si oui, précisez :
- Localisation du patient : Chambre double pendant l'hospitalisation ◘ Non ◘ Oui Précisez :
  Numéro de chambre :
  Patient transféré d'un autre service/ établissement ? ◘ Non ◘ Oui Si oui, précisez le parcours du patient :

- EVASAN : □ Non □ Oui
- Transfert au cohorting : □ Non □ Oui Si non, précisez :

---

3) Investigations réalisées à la date du signalement

□ Non □ Oui ◘ En cours
Précisez :

- Hypothèse sur la cause de l'évènement : □ Non □ Oui
  Précisez :

- Mesures prises ou programmées : □ Non □ Oui
  Précisez :

- Besoin d'expertise extérieure : □ Non □ Oui
  Précisez :

- Pensez-vous que l'évènement soit maitrisé : □ Non □ Oui
  Précisez :

---

4) Informations complémentaires (joindre tout document utile)

Patient, tuteur ou proche informé : □ Non □ Oui Si oui, date :
Fiche de liaison BHRe rédigée : □ Non □ Oui Si oui, date :
Commentaires additionnels du responsable du signalement (éléments de gravité, potentiel épidémique, caractère exceptionnel) :

Si BHRe : faire suivre le rapport d'investigation en précisant :

- Historique des antibiotiques
- Historique des hospitalisations
- Dépistages antérieurs
- Autres facteurs de risques d'acquisition et de dissémination (ATCD médicaux, hospitalisation en réanimation, dialyse)
- Conduite et mesures mises en place : dépistage des contacts, gestion des transferts intra/inter-établissement, sectorisation avec équipe dédiée, découverte d'un second cas (2nde fiche), résultats des dépistages…

APPENDIX 17: Liaison sheet for patients with BHR or BMR or contacts of BHR

DASS
Direction des Affaires Sanitaires et Sociales

FICHE DE LIAISON
PATIENT PORTEUR de Bactéries Hautement Résistantes émergentes (BHRe) ou Multi Résistantes (BMR)
- version oct 2017

Cette fiche doit être adressée au service receveur en cas de transfert ou au médecin traitant en cas de sortie à domicile.

Identification du patient (manuscrit /étiquette)

Nom :
Prénom :
Date de naissance :
Service actuel :
Chambre / Lit n° :
Etablissement :

Service et établissement receveurs :

PATIENT PORTEUR de BHRe :

Prélèvement positif du : ...../...../.....

Type de BHRe :

□ **ERV** *Enterococcus faecium* résistant à la vancomycine

□ **EPC** Entérobactérie productrice de carbapénémase

Si EPC, germe :

PATIENT PORTEUR de BMR :

Date et type de prélèvement : ...../...../..... .....

□ **SARM** *Staphylococcus aureus* résistant à la méticilline

□ **EBLSE** Entérobactérie productrice de bêta-lactamase à spectre étendu

Si EBLSE, germe :

□ **PARC** *Pseudomonas aeruginosa* résistant à la ceftazidime

Fiche remplie par :

Nom :
Fonction :
Signature :
Date : ...../...../.....

!! ***A minima, application stricte des précautions standard ET des précautions complémentaires d'hygiène adaptées à la transmission de la bactérie ; en cas de BHRe, le patient doit être mis en chambre seule & gestion des excretas***

APPENDIX 18: BHR Patient Contact Liaison Form

DASS
Direction des Affaires Sanitaires et Sociales

FICHE DE LIAISON
PATIENT CONTACT de Bactéries Hautement Résistantes émergentes (BHRe)
- version oct 2017

Cette fiche est à remplir devant tout patient contact de patient porteur BHRe et identifié à haut risque (partage de chambre et/ou de sanitaires avec le porteur, patient contact présentant lui-même des facteurs de risque de portage BHRe (exemple : patient dialysé)).

Cette fiche doit être adressée au service receveur en cas de transfert ou au médecin traitant en cas de sortie à domicile.

Identification du patient (manuscrit /étiquette)

Nom :
Prénom :
Date de naissance :
Service actuel :
Chambre / Lit n° :
Etablissement :

Service et établissement receveurs :

PATIENT CONTACT de BHRe

Type de BHRe isolée chez le porteur : □ **ERV** *Enterococcus faecium* résistant à la vancomycine
□ **EPC** Entérobactérie productrice de carbapénémase

Dépistage déjà réalisé chez le patient contact : □ Oui □ Non

Si oui :

	1er dépist.	2nd dépist.	3è dépist.
Date prélèvement (JJ/MM/AA)			
Résultat positif (+) ou négatif (-)			

Rappel : hors situation épidémique, 2 dépistages sont à réaliser à au moins 72h d'intervalle. Après obtention de 2 dépistages négatifs, les PCC peuvent être levées.
En situation épidémique : nécessité d'obtenir 3 dépistages négatifs.

Fiche remplie par :

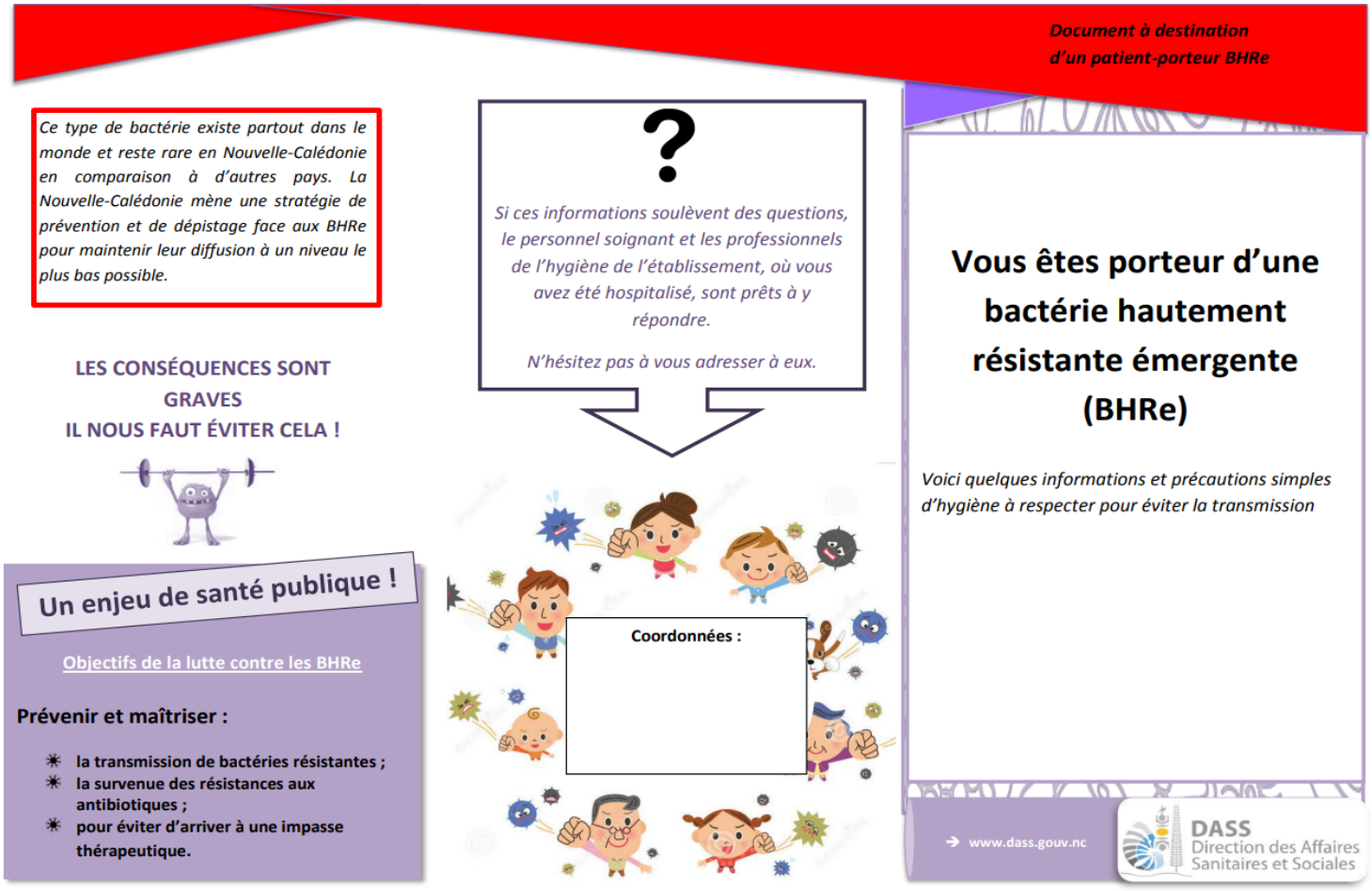
Nom : **Date :** ……/……/……

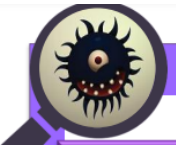
Fonction :

Signature :

!! *A minima, pour un patient contact BHRe pris en charge en milieu de soins, application stricte des précautions standard ET des précautions complémentaires contact & gestion des excretas*

APPENDIX 19: BHRe carrier patient flyer





Qu'est-ce qu'une BHRe ?

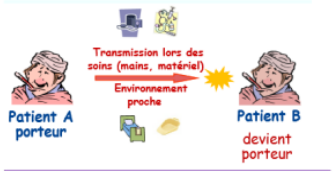
Le tube digestif contient naturellement des bactéries. Certaines d'entre elles, sous l'effet de traitement antibiotique, deviennent totalement résistantes aux antibiotiques. Par ailleurs, ces résistances peuvent se transmettre d'une bactérie à l'autre et rendre le traitement des infections très difficile. On appelle ces bactéries hautement résistantes émergentes (BHRe), car elles émergent depuis quelques années dans la population.

Cette bactérie peut alors nous rendre malade : **le patient est infecté**.

Toutefois, nous pouvons aussi être porteur et ne présenter aucun symptôme, on parle alors de **colonisation.**

Le plus souvent, la bactérie disparait spontanément de l'organisme.

Comment se transmet une BHRe ?



Comment sait-on que l'on est porteur ?

La présence de BHRe est identifiée par un dépistage au niveau rectal.

A ma sortie du service, quelles types de précautions ?

✷ **Lors d'un retour à domicile :**

PAS DE PRÉCAUTION PARTICULIÈRE
Vous pouvez reprendre vos activités relationnelles et professionnelles.

Cependant, il faut respecter les règles d'hygiène de base du quotidien :

Se laver les mains :

- Après être allé aux toilettes ;
- Après avoir manipulé du linge sale, un pansement souillé ;
- Après avoir toussé, éternué, s'être mouché ;
- Avant de préparer un repas ou de passer à table.

Signalez
au moyen de la fiche de transfert qui vous sera remise,
votre statut de Patient-Porteur aux personnes qui vous soignent :

- Infirmier
- Aide-soignant
- Médecin
- Kinésithérapeute
- Pédicure, etc…

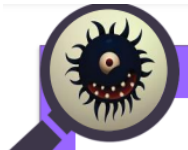
Ils respecteront rigoureusement les précautions d'hygiène, car ils prennent en charge d'autres patients potentiellement fragiles.

Contactez
votre médecin, de nouveaux prélèvements pourront être réalisés afin de savoir si vous êtes toujours porteur de la bactérie dans les mois suivant votre hospitalisation.

✷ **Lors d'une réhospitalisation :**

Si vous devez à nouveau être hospitalisé dans l'année qui suit, signalez dès votre admission que vous êtes ou avez été porteur d'une BHRe lors d'une précédente hospitalisation afin que les précautions spécifiques d'hygiène soient mises en place.
Un nouveau prélèvement pourra être réalisé.

APPENDIX 20: BHRe Patient Contact Patient Flyer



Qu'est-ce qu'une BHRe ?

Le tube digestif contient naturellement des bactéries. Certaines d'entre elles, sous l'effet de traitement antibiotique, deviennent totalement résistantes aux antibiotiques. Par ailleurs, ces résistances peuvent se transmettre d'une bactérie à l'autre et rendre le traitement des infections très difficile. On appelle ces bactéries hautement résistantes émergentes (BHRe), car elles émergent depuis quelques années dans la population.

ATTENTION !

Lorsque les BHRe sont présentes dans notre organisme, on dit que l'on est PORTEUR.

Cette bactérie peut alors nous rendre malade : **le patient est infecté**.

Toutefois, nous pouvons aussi être porteur et ne présenter aucun symptôme, on parle alors de **colonisation**.

Le plus souvent, la bactérie disparaît spontanément de l'organisme.

Comment se transmet une BHRe ?

A ma sortie du service, quels types de précautions ?

✷ **Lors d'un retour à domicile :**

PAS DE PRÉCAUTIONS PARTICULIÈRES

Vous pouvez reprendre vos activités relationnelles et professionnelles.

Cependant, il faut respecter les règles d'hygiène de base du quotidien :

Se laver les mains :

- ✷ Après être allé aux toilettes ;
- ✷ Après avoir manipulé du linge sale, un pansement souillé ;
- ✷ Après avoir toussé, éternué, s'être mouché ;
- ✷ Avant de préparer un repas ou de passer à table.

Une fiche de transfert informera sur votre statut de Patient-Contact aux personnes qui vous soignent :

- ➢ Infirmier
- ➢ Aide-soignant
- ➢ Médecin
- ➢ Kinésithérapeute
- ➢ Pédicure, etc…

Ils respecteront rigoureusement les précautions d'hygiène, car ils prennent en charge d'autres patients potentiellement fragiles.

✷ **Lors d'une réhospitalisation :**

Si vous devez à nouveau être hospitalisé dans l'année qui suit, signalez dès votre admission que vous avez été au contact d'un patient connu porteur d'une BHRe lors d'une précédente hospitalisation afin que les précautions spécifiques d'hygiène soient mises en place.

Un nouveau prélèvement pourra être réalisé.