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Towards an Information System on Health Care Costs, Public and Complementary Health Insurance Reimbursements, and Out-of-pocket Payments

MONACO Project: Report and Perspectives

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The MONACO project (Methods, Tools and Standards for Statutory and Complementary Health Insurance Data Linkage, *Méthodes, outils et normes pour la mise en commun des données des assurances complémentaire et obligatoire*) is a first step toward the creation of an information system aimed at improving knowledge on beneficiaries' remaining out-of-pocket payments (OOP) after reimbursement by the National Health Insurance (NHI) and complementary health insurance (CHI) schemes. It involves testing the technical possibility of linking individual records from the NHI and CHI providers administrative files based on the Health, Health Care and Insurance Survey (ESPS) framework. MONACO combines the main branches of the National Health Insurance scheme and ten organisations providing complementary health insurance under the auspices of the Institute for Health Information (IDS).

After a description of the data linkage methodology, we present first technical conclusions and a review of the research perspectives this new tool would enable.

In France, the regulation of ambulatory care demand is based on a cost sharing mechanism. The National Health Insurance (NHI) reimburses part of the reimbursable health expenditures. Remaining expenses, in the form of co-payments or excess fees, are paid directly by the patients or covered by their complementary health insurance if they have one. In 2011, CHI covered 13.7% of expenditures in health and medical goods consumption. Studies conducted by the High Council for the Future of Health Insurance (*Haut conseil pour l'avenir de l'Assurance*

maladie, HCAAM) show a slight increase in the share of CHI expenditures related to the consumption of care and medical goods since the beginning of the years 2000 (12.4% in 2000, 13% in 2005 and 13.7% in 2011), but more especially a wide dispersion of out-of pocket payments (OOP) after reimbursement by the NHI, including among long-term illness scheme beneficiaries (*affection de longue durée*, ALD) normally exempt from co-payments [HCAAM, 2013]. The distribution, social distribution and trends in complementary reimbursements and remaining OOP, are currently poorly documented due to the absence of reimbursement data from CHI providers in the national information systems.

Shedding light on statutory-complementary insurance share in reimbursements and OOP expenditures actually borne by households

The MONACO project (Methods, Tools and Standards for Statutory and Complementary Health Insurance Data Linkage) is a first step toward the creation of an information system aimed at improving knowledge on beneficiaries' out-of-pocket payments after reimbursement by the National Health Insurance (NHI) and complementary health insurance (CHI) schemes. It involves testing the technical feasibility of linking individual records from the NHI and CHI provider datasets based on IRDES 2010 Health, Health Care and Insurance survey (ESPS, *Enquête santé et protection sociale*) [Insert 1 and Graph 1].

Data linkage is conducted at two levels. The first consists in linking records for a given individual from three sources (sur-

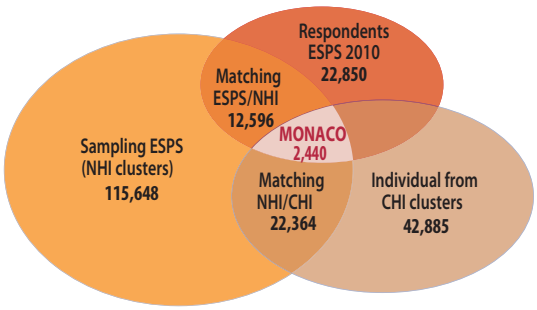
Method

MONACO project's data linkage methodology

The aim of the MONACO project (Methods, Tools and Standards for Statutory and Complementary Health Insurance Data Linkage) is to test the technical feasibility of linking statutory and complementary health insurance data. Data linkage is conducted on both personal data listings and expenditure listings.

Linking individuals

The MONACO sample is made up of individuals having participated in the 2010 Health, Health Care and Insurance survey (ESPS) registered in both Statutory Health Insurance reimbursement files and those of complementary health insurance providers participating in the experiment. Matching ESPS respondents with National Health Insurance data is carried out by IRDES as a routine procedure using a tried and tested methodology since 1992. To link them with individuals insured with complementary insurance providers participating in the experiment, we used the same validated methodology used in the first data matching process. Individuals are identified by means of their unique National Health Insurance number, the first four letters of their first name, gender and date of birth. Taking these four criteria into account made it possible to match almost 97% of individuals (mismatches can occur through spelling errors in the first name or the date of birth…). In total, the MONACO sample is made up of 2,440 individuals.



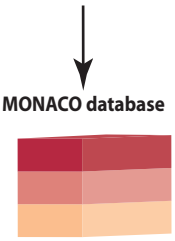
Linking expenditures

The linkage of matching expenditure listings was based on the following criteria: the anonymous individual identifier, the medical procedure code, the resulting expenditures and the amount reimbursed by the NHI scheme. Taking all these variables into account, we were able to match 79.7% of complementary health insurance listings (CHI) and 60.6% of statutory health insurance listings (NHI). Taking into account minor differences between source data (dates on which care was administered do not always tally between NHI and CHI sources), we were able to match 94% of NHI listings and 71.5% of CHI listings.

It is important to note that only ambulatory care consumers were taken into account as reimbursement data for public hospital care were not available at the time of the study.

G1 MONACO: linking data from three data sources

National Health Insurance data	**CNAMTS, CCMSA, RSI** Creating the ESPS sample from the General Sample of Beneficiaries (EGB)
Complementary health Insurance data	**Provident societies, mutual insurance companies, private insurance** Participation of the Federations: CTIP, FFSA, FNMF
Health, Health Care and Insurance survey data (ESPS)	**IRDES** Design and management of the ESPS survey Data linkage and data analysis



Institute for Health Data (IDS)
Project steering

IRDES
Project management

CCMSA: Central Agricultural Workers' and Farmers' Mutual Benefit Fund; **CNAMTS**: National Health Insurance Fund for Salaried Workers; **CTIP**: Technical Centre of French Provident Institutions; **FNMF**: National Federation of French Mutual Insurance Organizations; **FFSA**: French Federation of Insurance Companies; **RSI**: Social Security Fund for Self-employed Workers.
Participating insurance companies: ACM, Allianz, Axa, Groupama and Swisslife; provident societies: AG2R La Mondiale, Malakoff Médéric and Pro-BTP; mutual insurance companies: the Eovi group and Ociane.

Realisation: IRDES.

I1 The Health, Health Care and Insurance survey (ESPS)

Since 1988, ESPS collects data on health status, health insurance coverage, social situation and the use of health care services from a sample of 8,000 ordinary households; a total of 22,000 individuals. The sample is representative of around 97% of the population living in metropolitan France. The survey is based on a household panel, is conducted every two years and interviews the same respondents every four years. ESPS data is matched with health care consumption data provided by the National Health Insurance. ESPS contributes to the evaluation of public health policies, studies on the social determinants of health, access to health care services and complementary health insurance.

http://www.irdes.fr/esps

vey, statutory health insurance data, and complementary health insurance data). A second level consists in linking listings from National Health Insurance and complementary health insurance reimbursement records (Methods insert below).

The project brings together the main statutory health insurance sickness funds (National Health Insurance Sickness Fund for Salaried Workers (*Caisse nationale d'assurance maladie des travailleurs salariés*, CNAMTS), Sickness Fund for Self-Employed Workers (*Régime social des indépendants*, RSI), Agricultural Mutual Sickness Fund (*Mutuelle sociale agricole*, MSA) and ten complementary health insurers under the auspices of the Institute for Health Information (*Institut des données de santé*, IDS). IRDES is responsible for the project's management. Voluntary private insurers were mobilised by their federations: the Technical Centre for Provident Institutions (*Centre technique des institutions de prévoyance*, CTIP), the French Federation of Insurance Companies (*Fédération française des sociétés d'assurance*, FFSA), and the National Federation of Mutual Insurance Organizations (*Fédération nationale de la mutualité française*, FNMF). Among the ten complementary insurance organisations that agreed to participate, five were insurance companies and three provident societies. Data from the two participating mutual insurance companies were provided by the FNMF National Information System for Mutual Insurance Data (*Système national de données mutualistes,* SNDM). According to the results of the 2010 ESPS survey, these organisations cover around 20% to 25% of the market share, excluding local branches.

Below, we describe the sample structure, the data linkage methodology, present a first report on the linking of reimbursement data and finally, the project's scientific perspectives.

The MONACO sample

The MONACO sample is made up of a sub-sample of 2,440 individuals having participated in the 2010 ESPS survey. Inclusion criteria were twofold: that the individuals' health expenditures had been identified in the National Health Insurance database and that they were also covered by one of the complementary insurance providers participating in the experiment. The sub-sample contains a slightly higher percentage of men than women (52%). The employed working-age population represents 43% of the sample against 21% of retirees and 5% unemployed. Children and students represent 25% of the sample, housewives 5% and other inactive persons a little over 1%. The distribution of types of CHI provider reveals an under-representation of mutual insurance companies: 4 out of 10 individuals are covered by a provident society,

T1 MONACO sample: distribution of individuals by type of complementary health insurance organisation

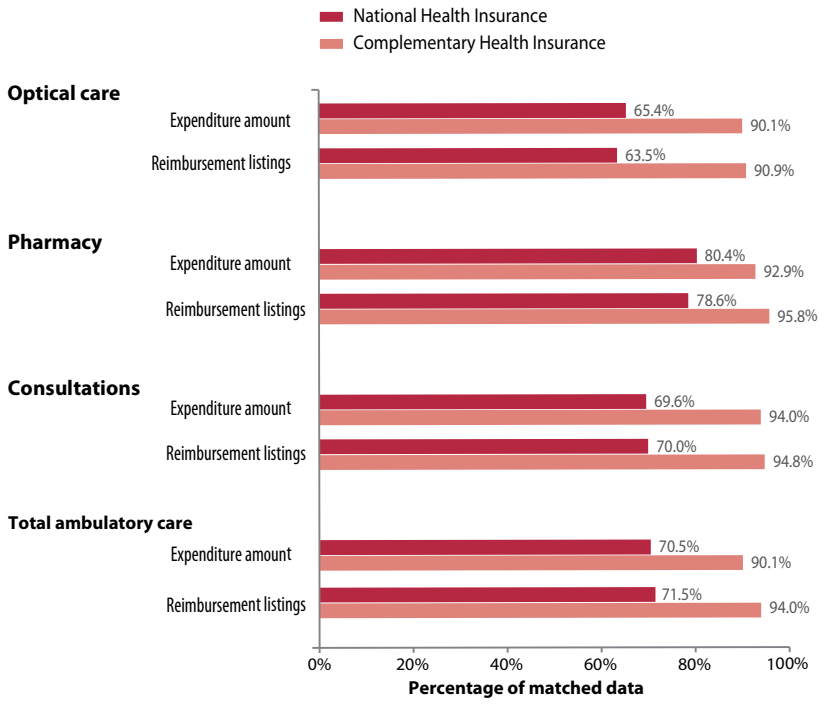
	Numbers	Percentage of individuals covered[1]	Coverage rate[2]
Types of organisation			
Provident societies	1,071	43.9	17.6
Insurance companies	1,109	45.5	26.8
Mutual insurance companies	291	11.9	55.6

[1] A same individual can be covered by several types of insurance organisation. Participating insurance companies were: ACM, Allianz, AXA, Groupama and Swisslife; provident societies: AG2R La Mondiale, Malakoff Médéric and Pro-BTP; mutual insurance companies participating in the SNDM; the Eovi group and Ociane.

[2] The DREES survey conducted among complementary health insurance organisations in 2008 was representative of the population covered by complementary health insurance and included local branches.

Source: ESPS - MONACO Download the Excel© file on the IRDES web site. Realisation: IRDES.

G2 Percentage of reimbursement and health expenditure listings matched by type of care



Source: MONACO Download the Excel© file on the IRDES web site. Realisation: IRDES.

5 an insurance company and 1 a mutual insurance company (Table 1).

Matching rates for matching complementary health insurance reimbursement listings are on average 94% for ambulatory care: for a hundred CHI reimbursement lines (within the NHI basket), 94 were successfully matched with NHI listings. For other healthcare services, the matching rate is mostly over 90%. Medical transportation reimbursements had a matching rate of around 71%. matching rates, when measured according to beneficiaries' expenditures are similar showing that unmatchable health care data do not necessarily correspond to those generating the highest expenditures (Graph 2).

The matching rate for Statutory Health Insurance reimbursement listings was on average 71% for ambulatory care. That is to say, for one hundred listings recording a NHI reimbursement and out-of-pocket payments susceptible of being reimbursed through CHI coverage, we find a complementary reimbursement in 71 cases. These lower matching rates essentially concern consultations (70% linkage) or nursing procedures (52%) for which we could have expected higher rates as they are more systematically covered by complementary health insurance contracts. The share of expenditures between National Health Insurance (NHI) schemes, complementary health insurance (CHI) schemes and beneficiaries' out-of-pocket payments (OOP) shows a similar distribution pattern to that outlined in other sources, as will be shown in the following paragraph.

Quality of reimbursement data

Do NHI, CHI and OOP shares produce estimates by MONACO produce credible orders of magnitude? Although the sample selection procedure and small size of the sample do not allow representative estimations, they must nevertheless remain realistic. We reconstitute the share of expenditures covered by each of the three sources (NHI, CHI, households), which requires generating hypotheses concerning NHI reimbursement lines without a corresponding CHI listing and CHI listings without a corresponding NHI listing (Methods insert below). The estimations obtained from the most credible hypothesis are presented below.

The breakdown of expenditures is presented in Table 2, compared with national account figures (source Eco-santé software). The results reveal orders of magnitude close to macro-economic figures, even without taking the characteristics of the MONACO sample population into account, in particular the absence of individuals without complementary health insurance coverage, CMU-C beneficiaries, and the under-representation of mutual insurance providers, including local

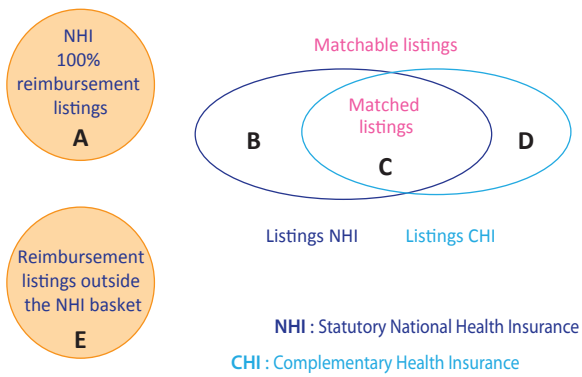
Method

Reconstitution of National Health Insurance (NHI) and complementary health insurance (CHI) shares

The sample of statutory health insurance and complementary health insurance expenditures is made up of expenditure listings. A medical procedure can correspond to several expenditure listings and one listing to several medical procedures. These breakdowns are not systematically identical in the two data sources.

Overall, expenditures can be grouped into four categories (diagram below):

- Part of the health expenditures are paid in total by the NHI (ALD, CMU-C exemptions for example) (**group A**)
- Another part, not included in the NHI basket of reimbursable care, is partially paid by the NHI (**group E**)
- Between these two situations, matched listings (that is to say in the NHI and potentially the CHI baskets of reimbursable care) at the core of the experiment. For the majority of them, there is both a NHI and CHI reimbursement (**group C**), 68%. However, certain NHI listings (30%) have no corresponding CHI listing; in other words, the care consumed is only associated with a NHI reimbursement (**group B**). In a symmetrical manner, 4% of CHI listings have no corresponding NHI listing ; that is to say that there is no trace of a NHI record for care identified as belonging in the NHI care basket in complementary health insurance information systems
- Groups B and D appear to be problematical. Group B can correspond to health care services not reimbursed by complementary health insurance, to lost listings, or care reimbursed by another CHI company than the one participating in the MONACO experiment. The **group D** is even more problematical in that it shows CHI reimbursements only for care included in the NHI basket of reimbursable care.



Estimation of expenditure amounts

In order to reconstitute expenditures, we make the following assumptions. We consider that residual benefit listings in the complementary health insurance files (group D) correspond to existing lines in the NHI files that have not been extracted.

- **Expenditure amount** is estimated from the patient's total expenditures for care reimbursed at 100% by statutory health insurance schemes, reimbursed care from matched listings, reimbursed care from unmatched SHI listings, and care reimbursed solely by complementary health insurance (**A**+**B**+**C**+**E**)
- **The amount reimbursed by statutory health insurance schemes** is estimated by the sum of reimbursements by statutory health insurance schemes at 100%, matched listings, residual unmatched SHI listings, and residual unmatched CHI listings (**A**+**B**+**C**+**D**)
- **The amount reimbursed by complementary health insurance** is estimated by the sum of CHI reimbursements from matched listings, residual unmatched CHI listings and reimbursements for care not included in the NHI reimbursement basket (**C**+**D**+**E**)
- **Out-of-pocket payments** are obtained by the difference between total expenditures and the sum of NHI and CHI reimbursements.

T2

Distribution of care expenditures between the National Health Insurance, complementary health insurance and households

	Expenditure categories			
	Ambulatory	Pharmacist	Consultations and visits to physicians and dentists	Optical
MONACO 2010				
NHI share	69%	78%	71%	4%
Complementary health insurance share	18%	17%	16%	39%
Household out-of-pocket payments	13%	4%	13%	57%
2010 National Account figures				
NHI share	63%	66%	-	-
Complementary health insurance share	22%	16%	-	-
State share	2%	1%	-	-
Household out-of-pocket payments	13%	17%	-	-

NB : The share paid by statutory health insurance schemes is over-estimated as it includes deductibles and flat-rate contributions that in reality are paid by the patient. The various contributions borne by the beneficiary represent less than 2% of the total expenditure.

Source: MONACO Download the Excel© file on the IRDES web site. Realisation: IRDES.

branches. Matching pairs of data reproduce globally credible distributions, a first result that should not be over-interpreted but is nevertheless encouraging.

Some promising results on technical faisability

The aim of the project is to assess the technical feasibility of matching data from the different insurance schemes' administrative files without aiming at this stage for representativeness or statistical power. The test phase assessment has proved encouraging and a synthesis of technical improvement perspectives is presented below.

Scope of coverage

In 2010, the MONACO sample scope covered almost a quarter of the complementary health insurance market, excluding so called « *Sections Locales Mutualistes* » (specific professional sickness funds that provide SHS as well as CHS). Increasing the number of participants, and more particularly mutual insurance organisations and their local branches would widen the scope of observation and improve awareness of supplementary insurance coverage. It should be reminded that it will be impossible to ensure total representativeness because of the high number of complementary insurance providers. Furthermore, it will always be difficult to obtain feedback from insurance brokers.

Quality of reimbursement data

Aggregate expenditures provide a realistic distribution between NHI, CHI and households. However, if the results of matching expenditure listings are encouraging, some grey areas remain. Improving exchanges between the National Health Insurance and complementary insurance providers as well as regroupments information systems should in term provide better quality linkage between consumption data sources. In addition, improvements to hospitalisation data should make it possible to reconstitute public hospital OOP and associated complementary health insurance reimbursements.

Sample size

If the 97% record matching rate for individuals is excellent, the MONACO sample is relatively small, counting 2,440 individuals. However, the tools developed within the project framework will enable matching larger samples. The ESPS sampling frame is made up of 115,000 individuals. Matching this data with complementary health insurance data, in other words without ESPS, could cover from 20,000 to 25,000 individuals. Data linkage based on the National Health Insurance General Sample of Beneficiaries (*Echantillon Généraliste de Bénéficiaires*, EGB) would further increase our sample size.

MONACO, research and evaluation perspectives

The 2013 National Inter-professional Agreement (*Accord national interprofessionnel ANI*) and the extension of CMU-C and financial assistance for the purchase of complementary health insurance (*Aide pour une complémentaire santé*, ACS) entitlement should significantly modify the dividing lines between statutory health insurance, complementary health insur-

I2

The National Inter-professional Agreement (ANI)

The National Inter-professional Agreement (*Accord national interprofessionnel,* ANI) signed by the social partners under the auspices of the government in January 2013 as part of the Law on Employment Protection instituted in June 2013, obliges all private sector employers, whatever their size and business sector, to propose complementary health insurance to all employees from January 1st 2016. It will be implemented progressively as of 2014 through branch negotiations and generalised on January 1st 2016. The aim of the agreement is to generalise access to complementary health coverage, and access to better quality coverage as employer-provided CHI is more advantageous than individual contracts. According to HCAAM estimations, it should concern 4.4 million employees of which 400,000 without CHI prior to the reform. Finally, the portability of insurance contracts for the unemployed will increase from nine to twelve months.

(according to the HCAAM on 18th July 2013 concerning the generalisation of complementary health insurance coverage and Pierre A., Franc C. "Generalization of Private Health Insurance offered by employers", The Health Systems and Policy monitor, April 2013).

ance and households OOP and also, between employer-provided and individual complementary health coverage (Insert 2).

The trends in public/private reimbursement sharing raise two types of question for research. On the one hand, it calls into efficiency and equity issues of the health system as a whole, that is to say including the roles played by the statutory and complementary insurance schemes. Does the division of roles between statutory and private insurance schemes enable the most effective allocation of collective resources? What do these changes imply in terms of redistribution? What are the roles played by the different types of insurance coverage in terms of financial accessibility to health care services? On the other hand, and in more general terms, it calls into question the role of companies within the framework of the social security system and its impact on the performance of the health system; that is to say in fine on populations' health.

These questions cannot all be treated from a single information system. Data from the National Health Insurance ESPS survey and complementary health organisations should make it possible to deal with issues relating to access to care and complementary health insurance, in particular:

- Research on out-of-pocket payments before and after complementary health insurance reimbursements, access to health care and the use of health care services.
- Research on access to CHI, coverage trends within the general population and among beneficiaries of both employer-provided and individual contracts.
- The monitoring of individuals without CHI in terms of health status and access to health care. ♦

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For further information

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