IDENTIFY FRAUD RISK IN HEALTH INSURANCE
DRUG-REIMBURSEMENT

GROUP 4

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1. **Painpoint**
Social Fraud is on the rise and yet it's pretty poorly monitored, **health insurance fraud alone rose by 20%** between 2011 and 2012.

2. **Context**
The social security needs to **save money** and **ensure its consumers’ health**. Unlike Tax evasion, health insurance fraud can have dire consequences on **public health**. Monitoring health insurance fraud can **save it money as well as limit the complications, misuse and overconsumption and their consequences on public health**.

3. **Analysis**
Analysis **datasets of drugs, diseases & reimbursements** (segmentation, principal component analysis, decision tree, correlation analysis) in order to better **understand the works and risk factors of off-label use** and to **propose means of prevention**
Creation of structured historical data for off-label use

4. **Objectives**
**Identify** the different types of fraud and the drugs that are more prone to it
**Recommend** action to **prevent or fight** the different types of fraud

5. **Recommendations**
**Harder prescription** conditions to limit access to the riskiest medications in order to limit both the financial and the public health risk
**Stricter monitoring** of the prescription to diagnosis relevance thanks to more datasets
**Financial Deterrance** to limit complacency

*All sources and references can be found in annexe*
# The Cost of Health Insurance Fraud is Both Human and Financial

It is thus a matter of both Health insurance and Public Health

The costs of misuse of drugs, such as the Mediator, is split between a financial and a human cost.

## Financial Cost of Mediator
- **879 M€**
  - To reimburse *prescribed* Mediator Boxes for the Health insurance between 1976 and 2009.
- **313 M€**
  - To cover for the costs of complications linked to the Mediator between 1976 and 2009.
- **1,2 B€**
  - Paid by the Health insurance and the taxpayer.

## Human Cost of Mediator
- **1750**
  - Patients had to undergo a surgical procedure due to the off label use of Mediator as a diet-drug.
- **2000**
  - Patients died due to the off label use of Mediator as a diet-drug.
- **80%**
  - Of Mediator’s 500,000 patients used it as a diet-pill. This means many more are at risk of cardiac complications.

## Objective

Curb fraud in the Social Security by:
- Monitoring the Mediator factor in reimbursable drugs.
- Scoring reimbursable drugs for potentially dangerous off-label use.
HOWEVER NEARLY EVERY DRUG CAN BE PRESCRIBED OFF LABEL
As a necessity and without posing a threat to public health so not every off-label prescription can be perceived as fraudulent

OFF-LABEL PRESCRIPTION IS NECESSARY
- Description: Using a drug outside the framework defined by its marketing authorizations is necessary and a way of making progress in the medicinal field
- Exemples: Pediatry (very little drugs approved), rare diseases...
- The risk is minimal: open label trials, use of the drug restricted to a defined field, usually closely related to it’s labelled prescription.

> 40% of all prescriptions are off-label prescriptions

ABUSIVE PRESCRIPTION: THE MEDIATOR FACTOR
- Description: reimbursable drugs prescribed for comfort purposes/personal use or as substitution for non-reimbursable products, usually regardless of diagnosis.
- Risk: over consumption of unnecessary drugs that are nevertheless reimbursed, substitution with beauty/comfort products and recreational use.
  This poses a threat both financially and humanly:
  - The further the prescription from the labelled used, the higher the public health risk.
  - The most common the off label prescription the higher the financial cost

DANGEROUS PRESCRIPTION : THE DIOVAN CASE
- Description: drug prescription outside marketing authorization without strict monitoring or open trials.
- Risk: unknown but potentially serious adverse effects

HOW CAN WE FOCUS ON ABUSIVE OFF-LABEL PRESCRIPTION AND MAKE IT APPART FROM « NORMAL » OR « TOLERATED » OFF-LABEL PRESCRIPTION?
### UNDERSTANDING THE DATASETS AND THE VOCABULARY

Is necessary to understand the analysis

<table>
<thead>
<tr>
<th>DATA SETS</th>
<th>VOCABULARY</th>
</tr>
</thead>
</table>
| **AMELI data base of reimbursements** | **Product:**
| ➢ Reimbursement basis for each commercial drug | Reference of a drug in a laboratory. This is based on the overall name given to the drug in a specific laboratory and doesn’t take format into account. Different products may belong to the same ATC class.
| ➢ Effective reimbursements for each commercial drug | **ATC Class:**
| | main active molecule in a drug (several laboratories may use the same molecule).

| **Data base of medications 2013** | **Anatomical class:**
| ➢ Prescription conditions for each drug | preferred zone of action of a molecule.
| ➢ Usage information for each drug | **Formulas**

| **Hit rate:** | **Number of molecules with fraudulent off-label uses** |
| | Number of molecules in the segment |

| **% fraudulent reimbursement vs Tot:** | Reimbursement of drugs known for fraudulent off-label |
| | Total reimbursement for the group |

| **Growth of prescriptions:** | growth of the number of boxes prescribed in 2013 vs. 2012 |
IDENTIFYING WHAT MAKES A DRUG MORE ELIGIBLE FOR OFF-LABEL USE IS THE KEY

As most abuse is at patients’ request, the more desirable a drug the more likely it is to be prescribed off-label.

**Method:**
Using past data (articles, research) as well the data of the Medication database on prescription requirements and usage information we determined a scale from one to 9 for different desirability factors that we assume may drive off-label use.

**1** SUBSTITUTIONALITY
Is there a known use of this category of drugs as a substitute for a non-reimbursable product?

<table>
<thead>
<tr>
<th>Categ</th>
<th>Use</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emollients</td>
<td>Face care</td>
<td>9</td>
</tr>
<tr>
<td>Diabetes drugs</td>
<td>Diet pills</td>
<td>9</td>
</tr>
<tr>
<td>Anti parasites</td>
<td>Veterinary use</td>
<td>9</td>
</tr>
</tbody>
</table>

**2** EASE OF ACCESS
How easy is it to use the drug without a professional’s help?

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liste I</td>
<td>GP*, no renewal specifications</td>
<td>9</td>
</tr>
<tr>
<td>Liste II, Liste I secure presc.</td>
<td>GP*, renewal specifications and conditions</td>
<td>6</td>
</tr>
<tr>
<td>Specialists only</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Hospital only</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Special services only</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

**3** EASE OF USE
Once you have it, how easy is it to use it?

<table>
<thead>
<tr>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A pill to take or cream to spread or a simple injection: no need for any understanding of what you’re doing</td>
<td>9</td>
</tr>
<tr>
<td>A more technical injection</td>
<td>4</td>
</tr>
<tr>
<td>An actual medical procedure</td>
<td>1</td>
</tr>
</tbody>
</table>

*GP stands for General Practitioner.*
There are 8 groups off pharmacological compounds with varying risk levels.

With 8 segments each with definite profiles and characteristics.

Method:
1) We ran a segmentation in order to create groups of medication with similar risk characteristics (desirability and commercial interest) and to assess their off-label risk.
2) We then used all the data available in medical reviews, internet forums and articles to determine the hit rate (part of off-label use in the segment) for fraudulent off-label use.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Risk Level</th>
<th>ATC Classes</th>
<th>Description</th>
<th>Hit Rate</th>
<th>Fraud Reimbursement</th>
<th>Growth of Prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low Risk</td>
<td>595</td>
<td>Common Medication</td>
<td>70%</td>
<td>-</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ATC Classes</td>
<td>Description: easy to use but restricted access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hit rate:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>% fraudulent reimbursement/total:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Growth of prescriptions:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Medium Risk</td>
<td>160</td>
<td>Confidential &amp; Specialized</td>
<td>22%</td>
<td>0.75%</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ATC Classes</td>
<td>Description: easy to use but restricted access (specialists only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hit rate:</td>
<td>14%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>% fraudulent reimbursement/total:</td>
<td>0.03%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Growth of prescriptions:</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Medium Risk</td>
<td>160</td>
<td>Broad &amp; Specialized</td>
<td>78%</td>
<td>2.38%</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ATC Classes</td>
<td>Description: easy to use but restriction to access (specialists only)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hit rate:</td>
<td>14%</td>
<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td>% fraudulent reimbursement/total:</td>
<td>0.03%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Growth of prescriptions:</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HIGHER OFF-LABEL USE COMES WITH HIGHER HEALTH AND FINANCIAL RISKS

pose a real threat to the patients and may cause tremendous aftermath

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Type of Drug</th>
<th>Off-Label Report</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial threat:</strong> High</td>
<td>Respiratory system</td>
<td>Doping</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular</td>
<td>Doping/ADHD</td>
</tr>
<tr>
<td></td>
<td>Nervous system</td>
<td>Sleeping pills, others</td>
</tr>
</tbody>
</table>

### Risk Assessment

- **Financial threat:** High – All together, their potentially fraudulent compounds account for **17,54%** of all reimbursement issued.
- **Public health threat:** High – off-label use very far from the original recommendation (from herpes to schizophrenia!), self medication and recreational use that come with high OD risk, strong side effects.
OVERALL, THERE SEEMS TO BE COMMON FACTORS THAT DETERMINE OFF-LABEL USE

Fraudulent off-label drugs are identifiable only when you look at the deviation from their original use.

Method:
After doing the segmentation, we ran a Decision tree analysis in order to determine what factors were the strongest determinants of off-label use and to verify the relevance of our hypotheses.

1. **SUBSTITUABILITY**
   - p < 0.001
   - < 7.2
   - > 7.2

2. **SPENDINGS IN 2013**
   - p < 0.001
   - < 13 883 617 €
   - > 13 883 617 €
   - Off-label: 50.8%
   - Off-label: 20.4%
   - Off-label: 9.2%

3. **EASE OF USE**
   - p < 0.011
   - < 90 728 €
   - > 8,583
   - Off-label: 76.9%
   - Off-label: 20.4%
   - Off-label: 9.2%
   - **DANGER ZONE** material
   - **PERFORMANCE ENHANCEMENT** material

Our hypotheses are confirmed and there are indeed determinants that increase the risk of off label use. However, these determinants are not discriminating enough for us to understand what the best way of tackling the off-label issue is.
HOWEVER IT IS HARD TO IDENTIFY THEM WITH CERTAINTY AS OFF-LABEL USE DOESN’T HAVE UNIVERSAL CHARACTERISTICS

Fraudulent off-label drugs are identifiable only when you look at the deviation from their original use. The characteristics of an off-label drug vary depending on its use which makes them hard to identify altogether. Not all original uses have the potential for the same type of off-label use as they don’t share the same pharmacological characteristics.

Therefore, we compared the positionning of off-label-used drugs and acceptably-used drugs within the same anatomical zone of action.

**Method:**

LEGEND:

1: Metabolism & alimentation
2: Anti parasitic products
3: Cardio vascular system
4: Dermatologicals
5: Antiinfectives
6: Nervous system

**Fraudulent Off-label/ Acceptable use**

We focus on the fraudulent off-label use positionning.

**DIMENSIONS DESCRIPTION**

**Dimension 1** (43% of variance explained):

- How complex/precise is the drug’s use? (growth, number of ATC classes, ease of access)

**Dimension 2** (24.26% of Variance explained)

- Who is pushing for the off-label use? Is any medical knowledge needed to think of using this type of drug off-label? (ease of use, reimbursement rate, substituability)

**READING THE GRAPH**

Off-label use Medically motivated

Complex precise action

Simple use and purpose

Off-label use patient-induced

Very different drugs can be used off-label with the same mind set. We can distinguish 3 types of off-label uses from the large variations between the acceptable-use positionning and the fraudulent off-label use positionning. These different mindsets also have an impact on the average level of risk for the patient.

**INTERPRETATION**
THEREFORE WE CAN BETTER UNDERSTAND THE DIFFERENT TYPES OFF OFF-LABEL USE AND ASSESS THE RISK THEY CARRY

In order to then provide recommendations and assess impact

A  SIMPLIFYING USE

DESCRIPTION:
Prescribed at the patient’s request as he wants to benefit from one simple characteristic of the drug, usually as a substitute for a non-reimbursable product

MINDSET:
Goal oriented: immediate and direct simple effect

HEALTH RISK ASSESSMENT:
- Low to Average - here are usually few side effects but the risk exists nonetheless

FINANCIAL RISK ASSESSMENT:
- High - these drugs account for 688 M€ in spendings each year and their off label use is prevalent

B  SIDE EFFECTS CAPITALISATION AND ABUSIVE PRESCRIPTION

DESCRIPTION:
Prescribed by generalists at the patient’s request when these drugs would call for a more specialized diagnosis.

MINDSET:
Abusive use, recreationnal use, comfort use

HEALTH RISK ASSESSMENT:
- High – these drugs are known to cause addiction, and are used in most medication-induced suicide cases. These drugs may come with strong side effects that are not monitored sufficiently and be abused

FINANCIAL RISK ASSESSMENT:
- High – These drugs account for 53.9M€ in spendings each year

C  MAD SCIENTISTS EXPERIMENTS

DESCRIPTION:
Use very far from the original prescription. Really risky and experimental use

MINDSET:
Physicians’s experimenting

HEALTH RISK ASSESSMENT:
- High – No one really knows if the drugs are efficient in their off-label use or what the side effects might be
- Low - Off-label use for these drugs is not prevalent.
**STRICT MEASURES NEED TO BE IMPLEMENTED TO REDUCE FINANCIAL AND HUMAN RISKS**

We suggest you take three steps against off-label and prescription abuse:

1. **PREVENTION & REDUCTION OF ACCESS**
   - Limit access to high-risk drugs and enforce diagnosis
     - Limit prescription to specialists' prescriptions and ask for new consultations to renew their prescriptions (ex: antidepressant)
     - Estimated cost: 120M€
   - Get proof to give drugs
     - Ask patients to make specific analysis, the results of which must be attached to the prescription (ex: diabetic drugs)
     - Estimated cost: 24.65M€
   - Primary deterrence
     - Reduce the reimbursement rate of some drugs
     - Ask the reimbursement request to be specified on the prescription
     - Estimated cost: 0€

2. **IMPLEMENTATION OF A CHECKING DATABASE**
   - Implement a diagnosis/drugs/patients/physicians database to make sure there is a match
     - Between disease and prescription. In case of discrepancies between the common prescriptions for a diagnosis, deny reimbursement as a deterrent
   - Monitor side effects to detect the riskier drugs for patients
     - The earlier you can identify side effects, the better you can care for those affected with the lowest cost
   - Cost estimate
     - May vary depending on the current state of monitoring and precision of data base
     - Suggestion of structure in Annexes.

3. **DETERRENCE OF COMPLACENTS**
   - Control potentially fraudulent physicians through “fake” patients asking for off-label prescriptions in order to prevent ultimately off-label prescriptions providers from providing.
   - Implement an increasing fine system
     - 3000 euros for the first offence
     - 5000 euros for the second one
     - 10 000 euros for the third one
   - Cost estimate
     - If the monitoring and detection are efficient enough they could be pretty low. Once again, it depends on the current forces.

NB: The step 2 can also be accomplished by putting the datasets mentioned in the Suggestion of structure annex in the open data with anonymized identifiers.

NB: All Hypothesis are explained in annexes.
Each of them yields strong impact both financial and human: save millions and save lifes

**FINANCIAL IMPACT:** 144M€

<table>
<thead>
<tr>
<th>Steps</th>
<th>Can help the health insurance to save:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substituables</td>
<td>Performance</td>
</tr>
<tr>
<td><strong>Sympotizing Use</strong></td>
<td></td>
</tr>
<tr>
<td>$\text{€ off label}$</td>
<td>158M€</td>
</tr>
<tr>
<td>$% \text{ Fraud (*)}$</td>
<td>50%</td>
</tr>
<tr>
<td>Savings with step 1</td>
<td>79 000 000 €</td>
</tr>
<tr>
<td><strong>Abusive</strong></td>
<td></td>
</tr>
<tr>
<td>$\text{€ off label}$</td>
<td>230M€</td>
</tr>
<tr>
<td>$% \text{ Fraud (*)}$</td>
<td>25%</td>
</tr>
<tr>
<td>Savings with step 1</td>
<td>57 500 000 €</td>
</tr>
<tr>
<td><strong>Mad Doctor</strong></td>
<td></td>
</tr>
<tr>
<td>$\text{€ off label}$</td>
<td>30,9M€</td>
</tr>
<tr>
<td>$% \text{ Fraud (*)}$</td>
<td>10%</td>
</tr>
<tr>
<td>Savings with steps 1 &amp; 2</td>
<td>3 900 000 €</td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

195.4 M€
- 120 M€ (Costs of specialists)
- 25 M€ (Costs of analysis)

= 50 M€
of deficit reduction

94 M€
of deficit reduction

(*) According to our hypothesis (available in annexes slide)

Steps 3 ensures the minimization of fraud opportunities especially as the largest part of social security fraud comes from practitioners

**PUBLIC HEALTH IMPACT:** Better life quality, aftermath risk

- **Reduce aftermath risk** by monitoring dangerous off-label prescription
- **Reduce duration of treatment** by ensuring proper diagnosis
- **Decrease over-consumption and addiction risk**
- **Improve follow-up** to make sure the treatment is effective and to the point

Means better life quality and amounts millions euros savings each year
## Hypothesis Used to Determine Impact

So that you can get a better understanding of our results and estimates

### Cost Estimate for Specialist Consultations

The average cost of a consultation at a specialist’s is 40 euros.
The largest and main pool of patients affected is that of those under Nervous system medication and the number of such patients is estimated to 3M in France.

Eg: \[40 \times 3,000,000 = \text{cost of specialists}\]

### Cost Estimate for Test-Analysis

The average cost of the diabetis tests is 10 euros.
The off-label uses are detected on type II diabetis (non insuline dependant) and account for 85% of the total diabetis cases. There are 2,9M type II diabetis patients in France.

Eg: \[10 \times 0.85 \times 2,900,000 = \text{cost of analysis}\]

### Fraud % Estimate

We estimated the Fraud pourcentage of the different categories by working under a set of hypothesis.
Mediator use was 80% off-label which hints to a very high off-label use for the same type of drugs.
Drugs requiring medical knowledge are not as rempant in terms of off-label use.
Drugs that have no street value and can’t be abused have rather low off-label frequency.
This is how we evaluated our 5, 10, 20, 25 or 50% of fraud, according to each group’s specificities.

However, without any pas report on fraud uncoverings, these are estimations only.
POTENTIAL LIMITS TO OUR ANALYSIS

To be totally accurate

1. DATA SELECTION ACCURACY

**REDUCTION OF DATA:**
Deletion of 1,700 products that didn't have any historical records before 2013 on internet
Deletion of 1,700 products that didn't have any match between our different files
- From 13,000 to 10,000 indexed products
Smaller selection of data ➔ Maybe our model is not taking into account an important feature of off-label use that is not present anymore in our data selection

The data accuracy might have been affected by the aggregation choices we made
- Possible solution: Find more complete datasets to match every product thanks to its CIS code, its CIP7 code and its ATC class.

2. REPORTS OF OFF-LABEL USE

**LIMITS OF INTERNET REPORTS AND INFORMATION**
Assignation of 0 (No off-label use report) or 1 (Off label-use report) depends entirely on our research and if an off-label use of this product has been at least once indexed in a medical journal or on a forum.
For the first group, common medication, assignation of a 0 to all products because the risk was considered very small and there were too many products (400) to look for information for each of them.

But this can lower the validity and accuracy of our model.
It is also very difficult to estimate how common is the off-label use on this basis.
- Possible solution: Go and see hospitals, specialized institutes and medical professional that can give us non reported off-label uses on Internet

3. HYPOTHESIS ACCURACY

**FORMULATION OF HYPOTHESIS TO ESTIMATE THE FINANCIAL GAIN FROM OUR MEASURES:**
We made assumptions to calculate the financial impact of the measures we want to implement to reduce off-label use: how to estimate precisely how many physicians will continue to prescribe off-label drugs despite the first fine of 3000 euros, then the second of 5000 euros, and even the third one?
Moreover, we used average values for the cost of a specialist consultation or a proper diabetic analysis.
All these estimations don't enable us to be very precise in the estimation of the financial gain.
- Possible solution: Go and see physicians that can give us precise values for each type of different drugs.
Annexe 2 - PROPOSITION FOR DATA BASE STRUCTURE (for STEP 2)

The goal is to create a comprehensive data base, designed to help detect outliers and cut off-label fraud at the source.

**ACTORS**

**CLIENT**
- Social security ID
- Reimbursement
- Noticed side-effects

**ANALYSIS LAB**
- N°
- Location
- Priors

**PHYSICIANS**
- Licence ID (FINES N°)
- Location info
- Specialty/Generalist
- Previous alerts

**PHARMACIES**
- ID Number (ARS licence)
- Location
- Physician ID
- Pharmacy ID
- Pre-conditions (analyses results, diagnosis)

**CONSULTATIONS (key: N°)**
- Social security ID
- Physician ID
- Diagnostic
- Date
- Next step

**ANALYSIS (key N°)**
- N° lab
- N° Client
- Type
- Result

**PRESCRIPTIONS (key: N°)**
- Consultation N°
- Social security ID
- Physician ID
- Pharmacy ID
- Drug
- Pre-conditions (analyses results, diagnosis)
- Date of prescription:
- Date of delivery:

**REFERENCES**

**DISEASES**
- ID
- Name
- Symptomes
- List of approved prescriptions

**DRUGS**
- ID
- Laboratory
- ATC class
- Off-label report
- Side effects
- Prescription conditions…

This data base is more of a super structure of data-bases than an actual creation. Data should be anonymized too.
# Annexe 3 - SOURCES

## GOVERNMENTAL DATA
- Médicaments remboursés par l'assurance maladie – Data.gouv
- Données de consommation du médicament Médiator – Data.gouv
- Base de données des médicaments – Medicaments.gouv
- Normes d’étiquetage – Médicaments en vente libre – Santé Canada
- Off-label use in children – NCBI Gov
- Off-Label Use of Atypical Antipsychotics: An Update – US Department of Health&Human Services
- ATC/DDD Index 2014 – Norwegian Institute of Public Health
- All centralized human medicinal product by ATC code - Public Health, European Commission

## MEDICAL WEBSITES
- Le calcium, idéal pour la santé des os et la synthèse de la vitamine – Passeport Santé
- Index des Médicaments vétérinaires autorisés en France
- Niclosamide – ADWIA Phramaceuticals Co.
- Is OFF LABEL USE a side effect of Pentamidine Isethionate ? – MedsFacts
- Is OFF LABEL USE a side effect of Glimepiride ? – MedsFacts
- Valacyclovir (Valtrex) – eMedExpert
- TINIDAZOLE: CAPSULE – Wedewood Pharmacy, Veterinary
- Mediator, combien de morts ? La réponse se précise – AlloDocteurs
- Pourquoi le Buméthanide n’est pas un médicament contre l’autisme – Médiapart
- Normes d’étiquetage – Médicaments en vente libre – Santé Canada

## MAGAZINES/NEWSPAPERS
- Peut-on maigrir grâce aux plantes ? – Le Point
- Comment maigrir en toute quiétude avec lactulose – Magazine Science
- Ramipril lowered cardiovascular risk, but vitamin E did not - Cleveland Clinic Journal Of Medecine
- Novartis to pay $422.5M in off-label marketing case – Fierce Pharma Newsletter
- Dossier : Mediator, du drame sanitaire au scandale politique Marianne
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