FRENCH NATIONAL TRENDS IN CANCER INCIDENCE INTRODUCING STRATIFICATION BY ANATOMICAL SITE AND HISTOLOGICAL SUBTYPES

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GRELL meeting, Lisbon (May 2019)

Introduction (1)

- **Incidence, mortality and survival as key indicators**
  - To assess public health policies
  - To estimate health care needs of the population
- **Two regular updates in France of cancer incidence and mortality with different frequency and content**

1. **National trends (over a long period) every 5 years +++**
   - **1978-2000** (Remontet L et al, solid tumours and hematological malignancies 2003)
   - **1980-2005** (Belot A et al, solid tumours and hematological malignancies 2008)
   - **1980-2012** (Binder-Foucard F et al, solid tumours 2013 - Monnereau A et al, hémopathies malignes 2013)
   - **1990-2018** (Defossez G et al, solid tumours 2019 - Leguyader S et al, hematological malignancies 2019
2. **National projections (for the current year) every 2 years**
   - **2015** (Leone N et al, 2015) – based on observed data until 2011
   - **2017** (Jéhannin-Ligier K et al, 2017) – based on observed data until 2013

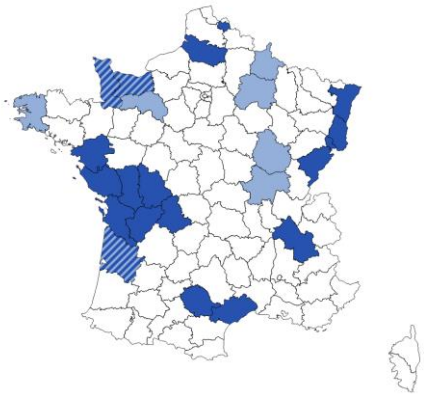
Introduction (2)

- **Cancer registries cover only a part of the population**
- National cancer incidence usually estimated by correcting registry-area incidence (I_R) using the ratio between national and registry-area mortality (M_{FR} / M_R)
- But **histological codes not available in mortality data**
- So what for hematological malignancies or cancer histological subtypes ??
- **New material** with increasing coverage of the registry-area in France => **New method** (see presentation Uhry Z)
- **New edition of national trends in cancer incidence over the period 1990-2018, introducing trends by anatomical site and histological subtypes**

METHODS (1)

- **Incidence data : French population-based cancer registries**
  - 22 % of the population (14 million people)
  - Start collection between 1975 and 2008
  - Estimates based on data observed between 1985 until 2015
  - Estimates for the years 2016 to 2018 derived from projections
- **Flexible models (multidimensionnal penalized splines: MPS)**
  - Using local registries data only (no longer corrective mortality factor)
  - Assumption that cancer registries area is representative of the entire country in terms of cancer incidence
  - Taking into account different start of collection and incidence levels between registries
  - MPS allows smooth trends by age

Cancer registries area



France

METHODS (2)

- **Increasing number of sites included in national trends**
- **Selected on topography and morphology sections of ICD-O3**

- A total of **74 types and subtypes of cancer**
- **1 site « overall cancer » (all cancers combined)**
- **27 solid tumours** (including 8 new sites)
  - With subdivision by **anatomical site** (x12) for: **LIP-MOUTH-PHARYNX, COLON-RECTUM, KIDNEY, SARCOMAS**
  - With subdivision by **histological subtypes** (x 10) for: **ESOPHAGUS, LUNG, OVARY, THYROID, TESTIS, CENTRAL NERVOUS SYSTEM**
- **24 entities of hematological malignancies**

METHODS (3)

- **Results summarized for all cancers combined**
- **Three examples illustrated on solid tumours**
  - Lung (C34) – for trends by histological subtypes
  - Colon-rectum (C18-21) – for trends by anatomical site
  - Cervix uteri (C53) – for trends by age
- Time-trends expressed from the **average annual percent changes*** in age-standardized incidence rates during two periods:
  - **1990-2018** (complet period)
  - **2010-2018** (recent period)
- Age-standardized cancer incidence rate per 100.000 (world standard population, Doll et al., 1996)

** AAPCs= average annual percent changes (% and [IC95])*

RESULTS

- **382 000 new cases in 2018**
  - 204 600 in male
  - 177 400 in female
- **Including 45 000 hematological malignancies** (12%)
- **Main sites** :
  - Male : 1/ Prostate, 2/ Lung, 3/ Colon-rectum
  - Female : 1/ Breast, 2/ Colon-rectum, 3/ Lung

Trends 1990-2018 : ALL CANCERS (C00-80)

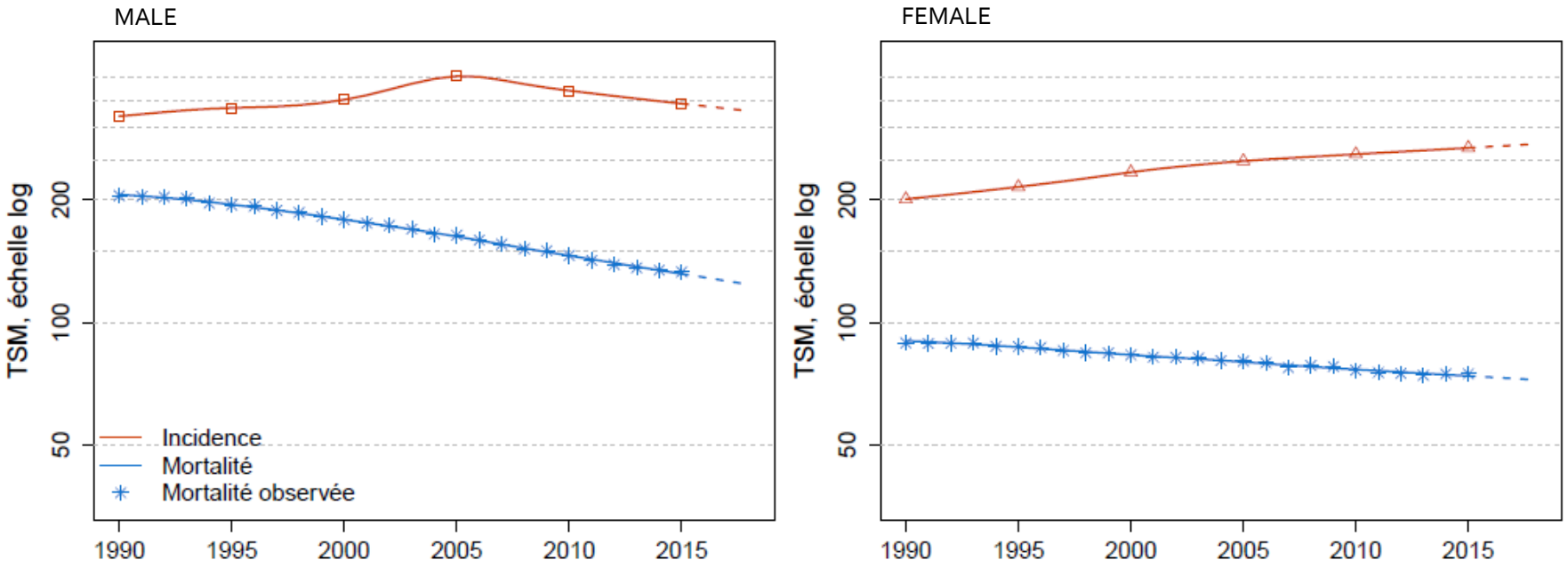


Figure 1: Evolution of age-standardized incidence (and mortality) rates of overall cancer by sex between 1990 and 2018 in metropolitan France - logarithmic scale

AAPCs	MALE		FEMALE	
	1990-2018	2010-2018	1990-2018	2010-2018
ALL CANCERS	**+ 0.1 % [0.1 ; 0.2]**	**-1.4 %[-1,6; -1,3]**	**+1.1 % [1.1; 1.2]**	**+0.7 % [0.5; 0.9]**
EXCLUDING PROSTATE	*- 0.1 % [-0.2 ; -0.1]*	*- 0.4 % [-0.6 ; -0.2]*	-	-
EXCLUDING BREAST	-	-	*+1.1 % [1.1; 1.2]*	*+1.0 % [0.8; 1.2]*

Trends 1990-2018 : **LUNG CANCER (C33-34)**

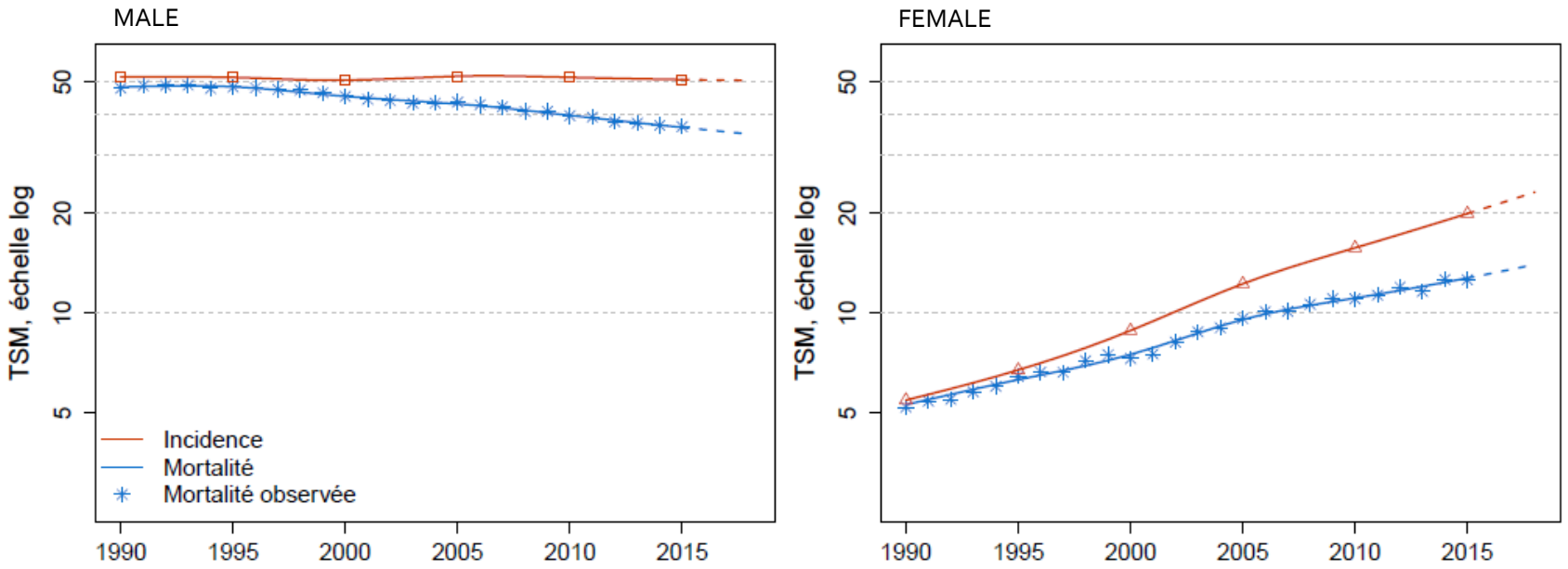


Figure 2: Evolution of age-standardized incidence rates of lung cancer by year between 1990 and 2018 in metropolitan France - logarithmic scale

AAPCs	MALE		FEMALE	
	1990-2018	2010-2018	1990-2018	2010-2018
LUNG	**-0.1 % [-0.2; 0]**	**-0.3 % [-0.6; 0]**	**+5.3 % [5.1; 5.5]**	**+5.0 % [4.4; 5.5]**

Trends 1990-2018 : **LUNG CANCER,** *BY HISTOLOGICAL SUBTYPES*

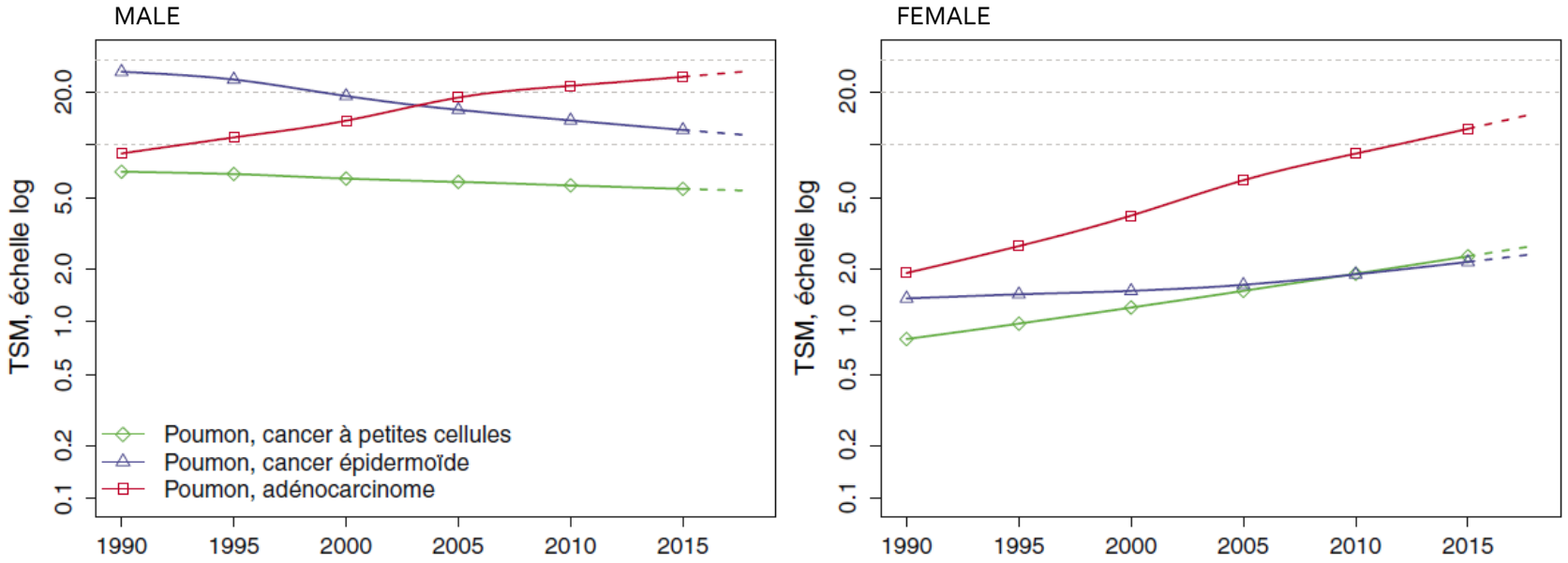


Figure 3: Evolution of age-standardized incidence rates of lung cancer by year and histological subtypes between 1990 and 2018 in metropolitan France - logarithmic scale

AAPCs	MALE		FEMALE	
	1990-2018	2010-2018	1990-2018	2010-2018
LUNG	-0.1 % [-0.2; 0]	-0.3 % [-0.6; 0]	+5.3 % [5.1; 5.5]	+5.0 % [4.4; 5.5]
ADENOCARCINOMAS	**+3.9 % [3.7; 4.1]**	**+2.4 % [2.0; 2.9]**	**+7.7 % [7.4; 8.1]**	**+6.8 % [6.1; 7.5]**
SQUAMOUS CELL	**-2.9 % [-3.1; -2.7]**	**-2.4 % [-2.9; -1.9]**	**+2.1 % [1.6; 2.6]**	**+3.4 % [2.2; 4.6]**
SMALL-CELL	**-0.9 % [-1.2; -0.6]**	**-0.9 % [-1.5; -0.2]**	**+4.4% [3.9; 5.0]**	**+4.7 % [3.9; 7.5]**

Trends 1990-2018 : **COLON-RECTUM CANCER (C18-21)**

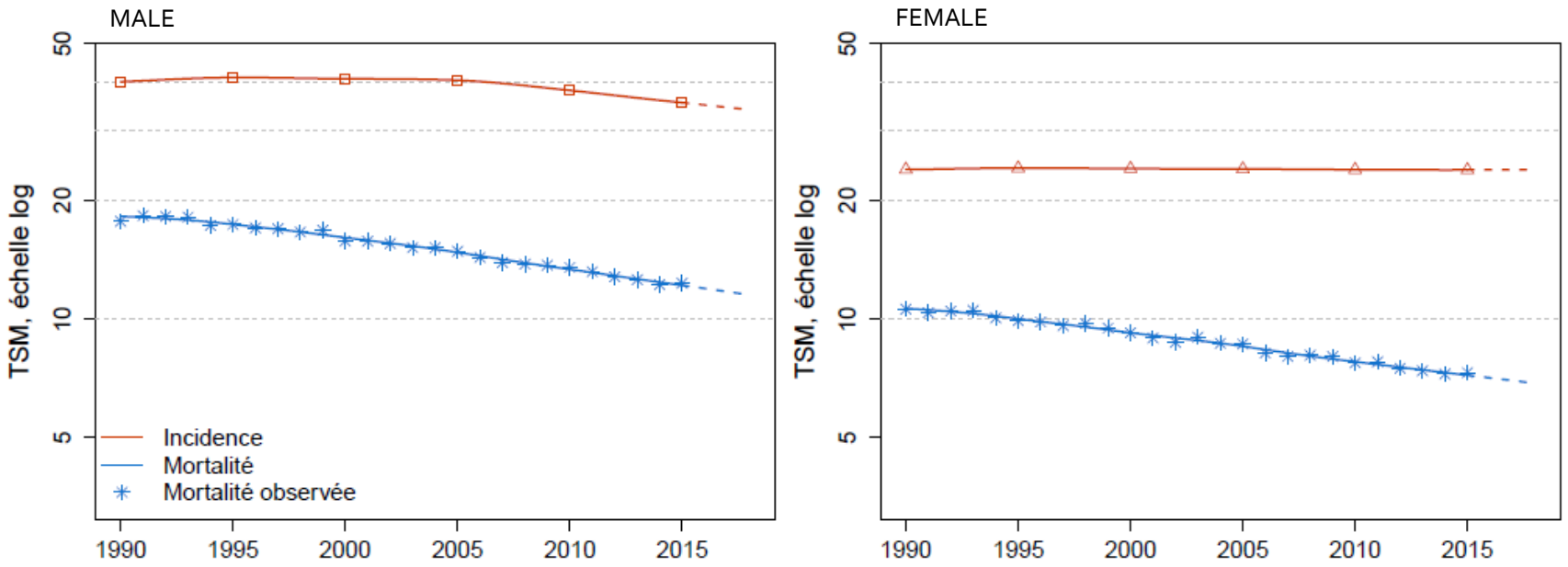
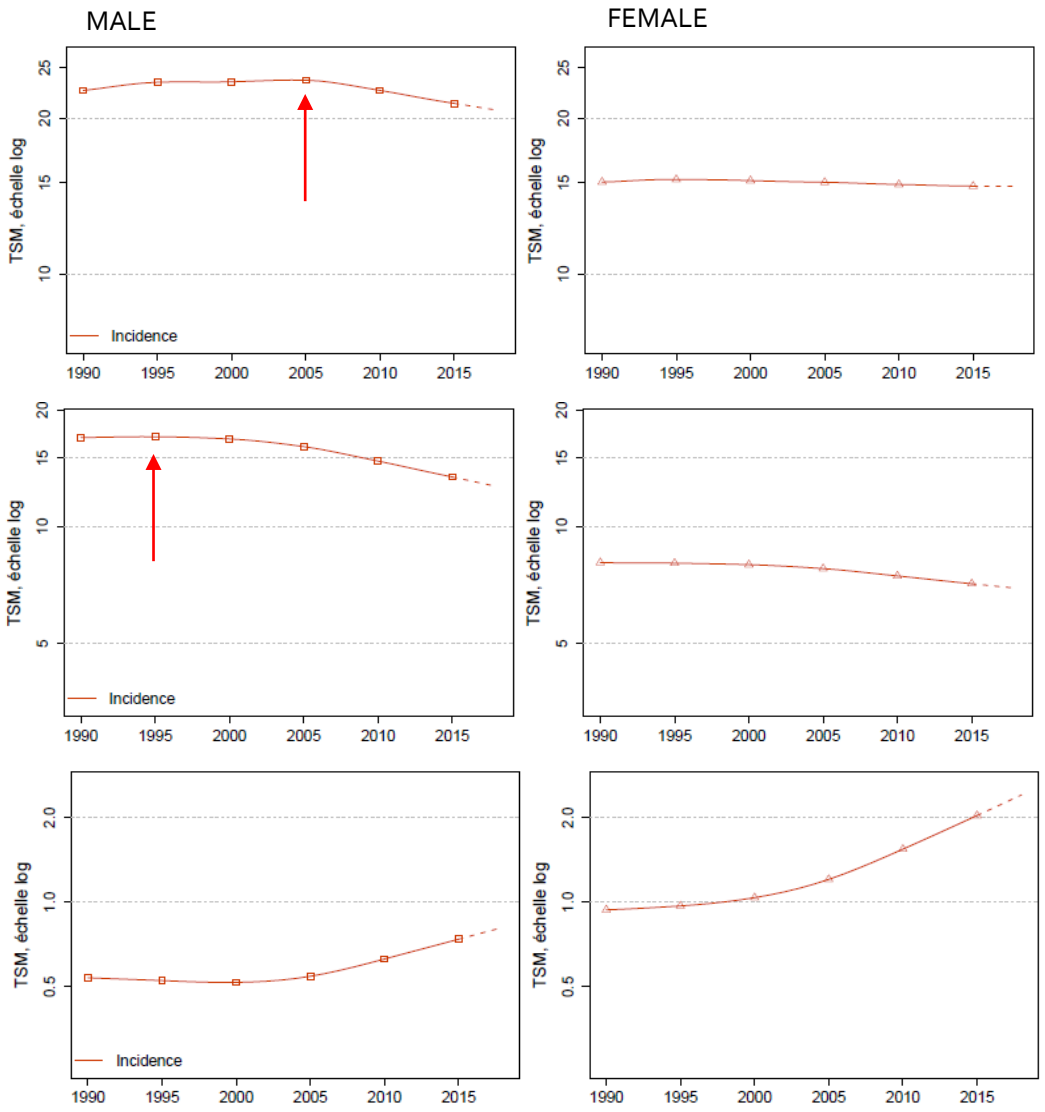


Figure 4: Evolution of age-standardized incidence rates of colon-rectum cancer by year between 1990 and 2018 in metropolitan France - logarithmic scale

AAPCs	MALE		FEMALE	
	1990-2018	2010-2018	1990-2018	2010-2018
Colon-rectum	**-0.6 % [-0.7; -0.5]**	**-1.4 % [-1.7; -1.1]**	**0 % [-0.1; 0.1]**	**0 % [-0.3; 0.3]**

Trends 1990-2018 : **COLON-RECTUM CANCER,** BY ANATOMICAL SITE



Colon (C18)

MALE		FEMALE	
1990-2018	2010-2018	1990-2018	2010-2018
-0.3 [-0.4; -0.2]	-1.1 [-1.5; -0.8]	-0.1 [-0.2; -0.1]	0 [-0.5; 0.2]

Rectum (C19-20)

MALE		FEMALE	
1990-2018	2010-2018	1990-2018	2010-2018
-1.0 [-1.2; -0.9]	-1.9 [-2.3; -1.5]	-0.5 [-0.7; -0.3]	-0.9 [-1.4; -0.4]

Anus (C21)

MALE		FEMALE	
1990-2018	2010-2018	1990-2018	2010-2018
1.5 [0.7; 2.2]	3.3 [1.5; 5.1]	3.4 [2.9; 3.9]	2.7 [1.9; 3.5]

Figure 5: Evolution of age-standardized incidence rates of colon (1), rectum (2) and anus (3) cancer by year between 1990 and 2018 in metropolitan France - logarithmic scale

Trends 1990-2018 : **CERVIX UTERI CANCER**

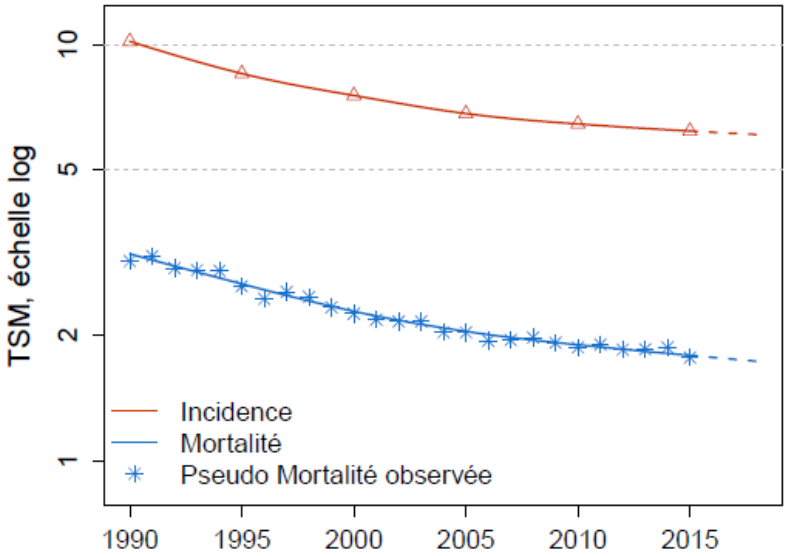


Figure 9: Evolution of age-standardized incidence rates of cervix uteri cancer by year between 1990 and 2018 in metropolitan France - logarithmic scale

AAPCs	1990-2018	2010-2018
Cervix uteri	**-1.8 [-2.1; -2.5]**	**-0.7 [-1.5; 0]**

Role of cervical cytology screening (smear test) in the declining morbidity and mortality of cervical cancer

Trends 1990-2018 : **CERVIX UTERI CANCER,** BY AGE

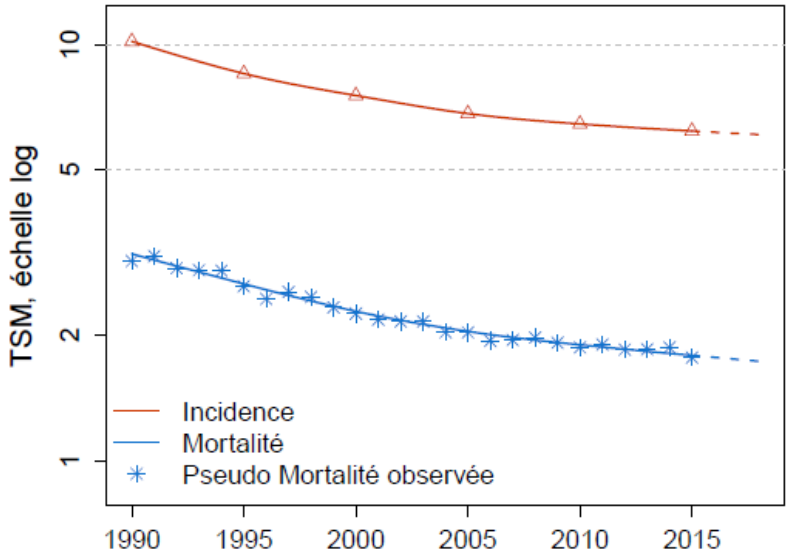


Figure 9: Evolution of age-standardized incidence rates of cervix uteri cancer by year between 1990 and 2018 in metropolitan France - logarithmic scale

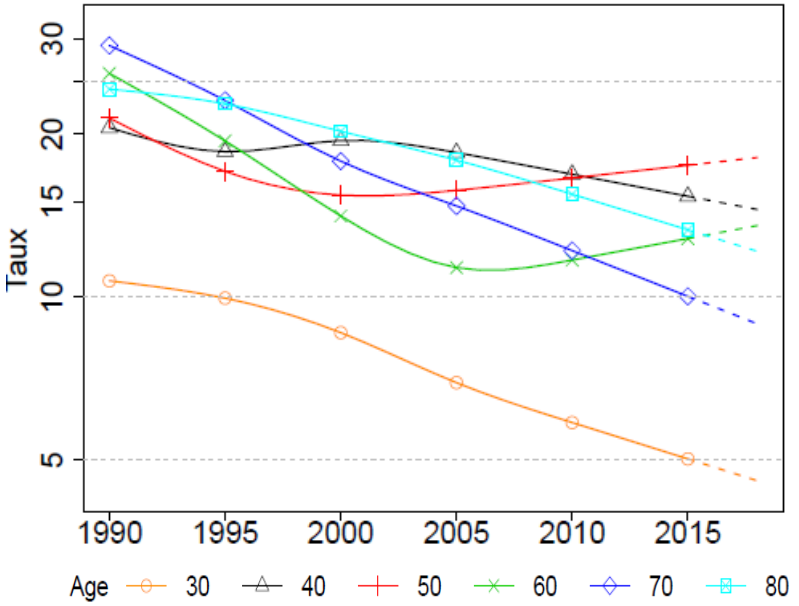


Figure 10: Evolution of incidence rates of cervix uteri cancer by age and year between 1990 and 2018 in metropolitan France - logarithmic scale

AAPCs	1990-2018	2010-2018
Cervix uteri	**-1.8 [-2.1; -2.5]**	**-0.7 [-1.5; 0]**

Slowing down of the incidence decrease of cervix cancers for women aged 50-60, suggesting changing patterns in risk behaviours

Age	1990-2018
30	**-3.2 [-3.8; -2.2]**
40	**-1,2 [-1.8; -0.7]**
50	**-0.6 [-1.2; 0]**
60	**-2.3 [-2.9; -1.7]**
70	**-4.1 [-4.8; -3.4]**
80	**-2.4 [-3.2; -1.7]**

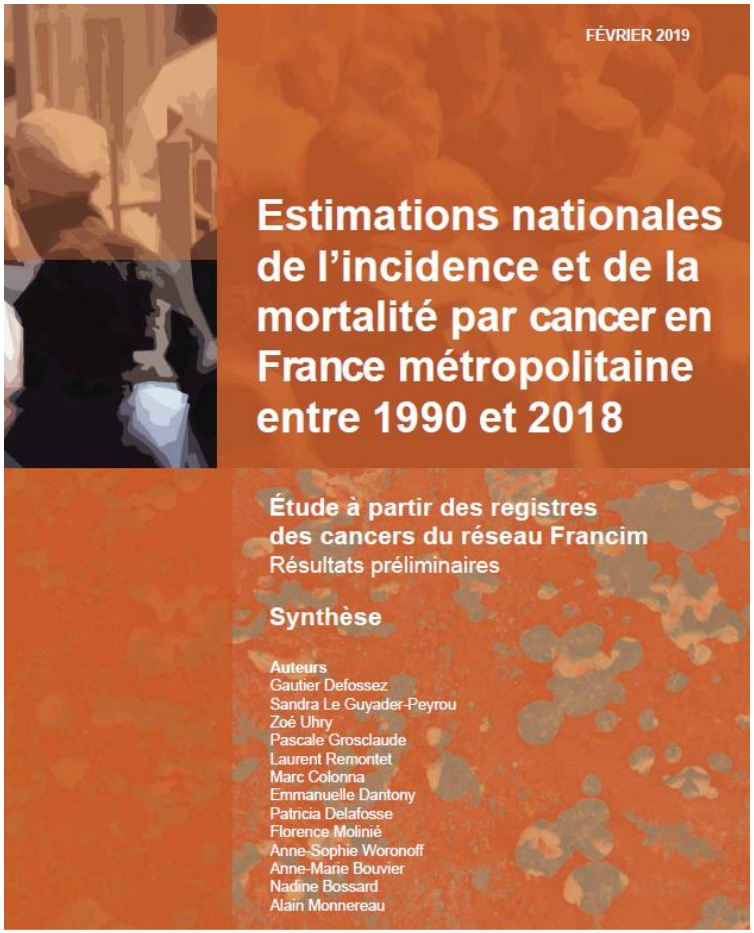
DISCUSSION/CONCLUSION

- Trends published by subtypes at the national level for the first time in France (also including trends by age for all cancers sites)
- Provide a better understanding of underlying complex trends related to specific risk factors / therapeutic modalities / prognosis
- Help to highlight emerging trends and ongoing transitions in the epidemiology of cancer that is highly relevant to future cancer control planning and clinical practice

- Further studies are needed to examine trends for a comprehensive list of cancers and to compare patterns in terms of their association with specific risk factors (obesity-related cancers, smoking-related cancers, infection-related cancers …)

See preliminary report following URL link

http://invs.santepubliquefrance.fr/Publications-et-outils/Rapports-et-syntheses/Maladies-chroniques-et-traumatismes/2019/Estimations-nationales-de-l-incidence-et-de-la-mortalite-par-cancer-en-France-metropolitaine-entre-1990-et-2018



- **Preliminary results on 5 priority sites** (prostate, lung, colon-rectum, breast, cervix uteri) published on the occasion of World Cancer Day, **4 Feb 2019**
- Two complete reports coming soon (June 2019)
  - Chapter 1 – **Solid tumours**
  - Chapter 2 – **Hematological malignancies**

This publication is the result of a partnership between

- *the French network of cancer registries FRANCIM*
- *the biostatistics-bioinformatics department of the Hospices Civils de Lyon (HCL)*
- *Santé publique France (SpF)*
- *Institut National du Cancer (INCa)*

FRENCH CANCER REGISTRIES INCLUDED IN THIS STUDY

Réseau Français des Registres de cancers

Francim

REGISTRES GÉNÉRAUX
REGISTRE DES CANCERS DU BAS-RHIN
REGISTRE GÉNÉRAL DES TUMEURS DU CALVADOS
REGISTRE DES TUMEURS DU DOUBS ET DU TERRITOIRE DE BELFORT
REGISTRE GÉNÉRAL DES CANCERS DE LA GIRONDE
REGISTRE DES CANCERS DU HAUT-RHIN
REGISTRE DES TUMEURS DE L'HÉRAULT
REGISTRE DU CANCER DE L'ISÈRE
REGISTRE GÉNÉRAL DES CANCERS DE LILLE ET DE SA RÉGION
REGISTRE GÉNÉRAL DES CANCERS EN RÉGION LIMOUSIN
REGISTRE DES TUMEURS DE LOIRE-ATLANTIQUE ET VENDÉE
REGISTRE DES CANCERS DE LA MANCHE
REGISTRE GÉNÉRAL DES CANCERS DE POITOU-CHARENTES
REGISTRE DU CANCER DE LA SOMME
REGISTRE DES CANCERS DU TARN
REGISTRES SPÉCIALISÉS
REGISTRE BOURGUIGNON DES CANCERS DIGESTIFS
REGISTRE DES TUMEURS DIGESTIVES DU CALVADOS
REGISTRE FINISTÉRIEN DES TUMEURS DIGESTIVES
REGISTRE DES CANCERS DU SEIN ET DES CANCERS GYNÉCOLOGIQUES DE CÔTE-D'OR
REGISTRE DES TUMEURS PRIMITIVES DU SYSTÈME NERVEUX CENTRAL DE LA GIRONDE
REGISTRE DES CANCERS THYROÏDIENS MARNE-ARDENNES
REGISTRE DES HÉMOPATHIES MALIGNES DE BASSE-NORMANDIE
REGISTRE DES HÉMOPATHIES MALIGNES DE CÔTE-D'OR
REGISTRE DES HÉMOPATHIES MALIGNES DE LA GIRONDE