

Data quality for esophageal, stomach, colorectal, liver and pancreas cancer in Brazilian Population-Based Cancer Registries

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Introduction:

Population-Based Cancer Registries (PBCR) are important sources of information in cancer surveillance. The aim of this study was to analyze the data quality of five gastrointestinal cancers according to the criteria of comparability, validity, completeness and timeliness in Brazilian cancer registries.

Methods:

Cross-sectional study in which data from Brazilian PBCR with more than ten years of historical series from the year 2000 were included, regardless of the type of geographic coverage defined state, metropolitan region or capital. Brazilian PBCR were evaluated according to: comparability, validity (accuracy), completeness and timeliness. We analyzed all cases of cancer, except cases of non-melanoma skin cancer, and five gastrointestinal tumors (cancer of the esophagus, stomach, colon and rectum, liver and pancreas) by cancer registries and sex, according to with the available period.

Results:

The 16 Brazilian PBCRs included in this study represent a population coverage of 17% of the national population (36 million inhabitants in 2021) with data between 2000 and 2018 (Figure 1). There was variation in the historical series between 12 and 19 years in incidence.

The proportion of morphologically verified (MV%) ranged from 74.3% (Manaus) to 94.8% (Aracaju), incident cases by death certificate only (DCO%) ranged from 3.0% (São Paulo) to 23.9% (Espírito Santo) (Table 1).

In timeliness, all PBCRs presented a delay greater than 48 months in the availability of incidence data in relation to the calendar year 2023, the shortest delay was 4 years, for Cuiabá and Belo Horizonte, and the greatest delay was 10 years for Espírito Santo (Table 1).

Table 1. Distribution of incident cases regarding the total and proportion of non-melanoma skin cancer (NMSC) cases, proportion of cases registered by morphologically verified (%MV), percentage of cases by death certificate only (%DCO), age ignored and unknown primary site (C80), except NMSC, by Brazilian PBCR.

Population-Based Cancer Registry	Period of diagnosis	All cases (C00-C80)			Cases, except non-melanoma skin cancer (C00-C80, exceto C44)						
		Total	NMSC	NMSC/total	All cases, except NMSC	%MV	%DCO	Age ignored	Unknown primary site (C80)		
	Years	N	N	%	N	%	%	N	%	N	%
North											
Belém	2000-2017	59,807	6,396	10.7	53,411	82.8	16.3	1,285	2.4	841	1.6
Manaus	2000-2014	38,135	3,439	9.0	34,696	74.3	20.5	391	1.1	847	2.4
Palmas	2000-2017	4,929	656	13.3	4,272	82.3	14.6	47	1.1	76	1.8
Roraima	2003-2014	5,745	1,045	18.2	4,700	75.1	21.3	941	20.0	246	5.2
Northeast											
Aracaju	2000-2016	43,376	14,685	33.9	28,691	94.8	4.6	40	0.1	240	0.8
João Pessoa	2000-2017	27,578	3,458	12.5	24,118	87.7	6.6	20	0.1	754	3.1
Fortaleza	2000-2015	93,694	18,748	20.0	74,940	84.6	12.1	1,214	1.6	2572	3.4
Recife	2000-2017	67,708	8,182	12.1	59,526	76.0	12.5	116	0.2	1,015	1.7
Central-West											
Cuiabá	2000-2018	35,524	7,956	22.4	27,566	86.2	12.5	192	0.7	597	2.2
Distrito Federal	2000-2017	95,658	14,227	14.9	81,422	81.5	16.3	7,378	9.1	1,533	1.9
Goiania	2000-2017	87,693	31,449	35.9	56,244	93.2	5.5	42	0.1	1,254	2.2
Southeast											
Belo Horizonte	2000-2018	173,753	37,374	21.5	136,372	90.3	92.2	649	0.5	5,157	3.8
Espírito Santo	2000-2012	27,249	1,877	6.9	25,371	76.0	23.9	46	0.2	510	2.0
São Paulo	2000-2015	656,917	124,974	19.0	531,943	84.4	3.0	35,304	6.6	28,620	5.4
South											
Curitiba	2000-2017	92,399	15,449	16.7	76,950	86.4	12.8	29	0.0	2,018	2.6
Porto Alegre	2000-2017	105,817	21,183	20.0	84,591	76.9	20.2	2,226	2.6	2,143	2.5

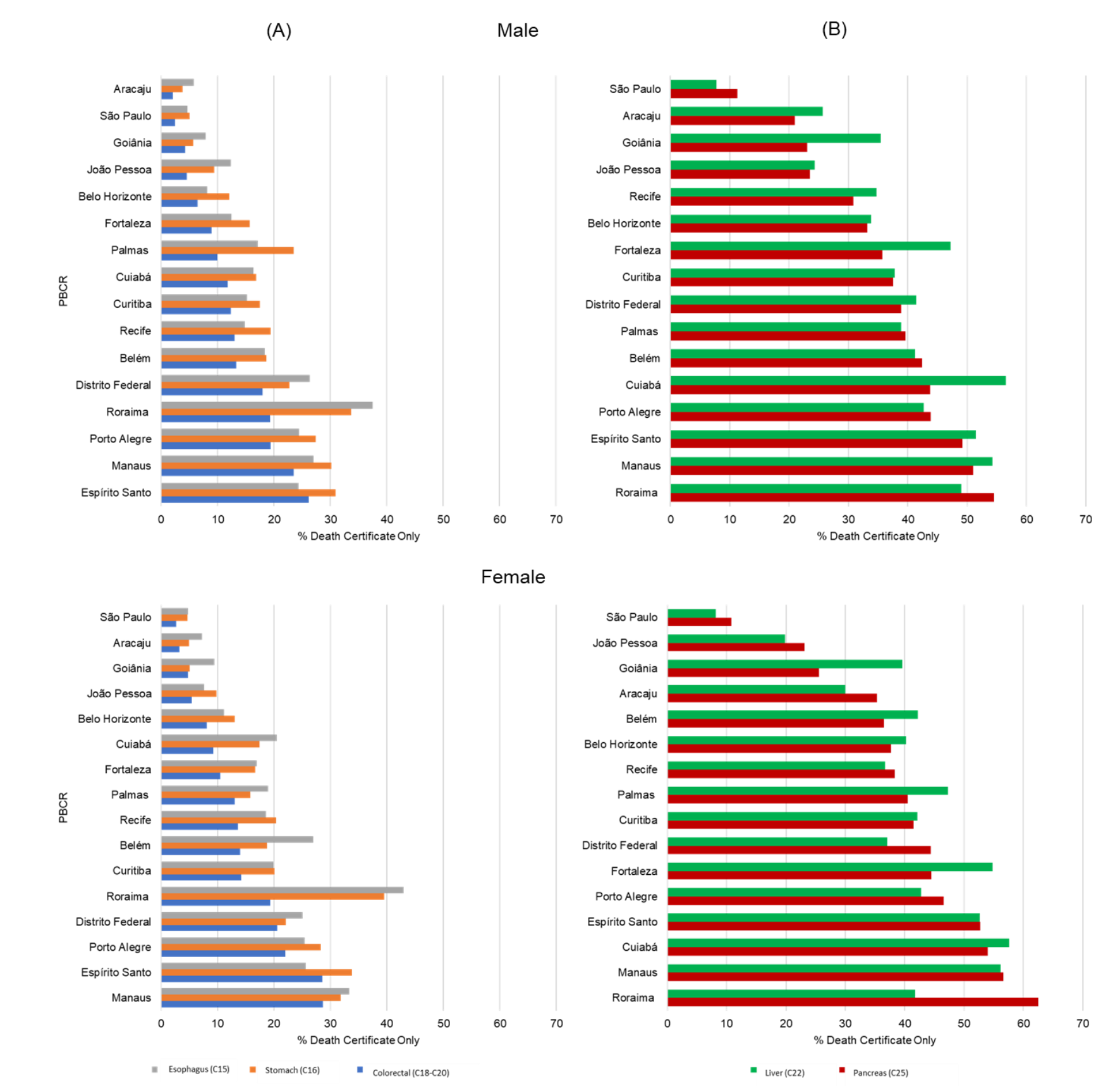


Figure 3. Proportion of death certificate only (%DCO) for tumors of the gastrointestinal tract (A) esophagus, stomach, colorectal and (B) accessory organs liver and pancreas, by PBCR and sex.

Indicators of proportion of morphologically verified (%MV) and death certificate only (%DCO) were inversely proportional to sex, men had a higher proportion of cases by death certificate above 20% in Porto Alegre, Manaus, Espírito Santo and Roraima (Figure 2).

In Roraima, the highest percentages of DCO were observed for cancers of the esophagus, stomach in both sexes, and pancreas for females, for liver cancer the highest percentage of DCO was observed in Cuiabá in men (Figure 3).

Among men, the mortality/incidence ratio was higher 1 for liver cancer in Espírito Santo (M:I 1.1; 95%CI 1.0;1.3), Fortaleza, Goiania and São Paulo (M:I 1.9; 95%CI 1.9;2.0), among women the M:I ratio was greater than 1 in Belo Horizonte, Espírito Santo, Cuiabá, Fortaleza, Goiania, João Pessoa and São Paulo. For pancreatic cancer, the M:I ratio greater than 1 was observed in both sexes in Curitiba, Espírito Santo, Goiania and São Paulo; including PBCR from João Pessoa and Manaus for men and Roraima for women (Figure 4).

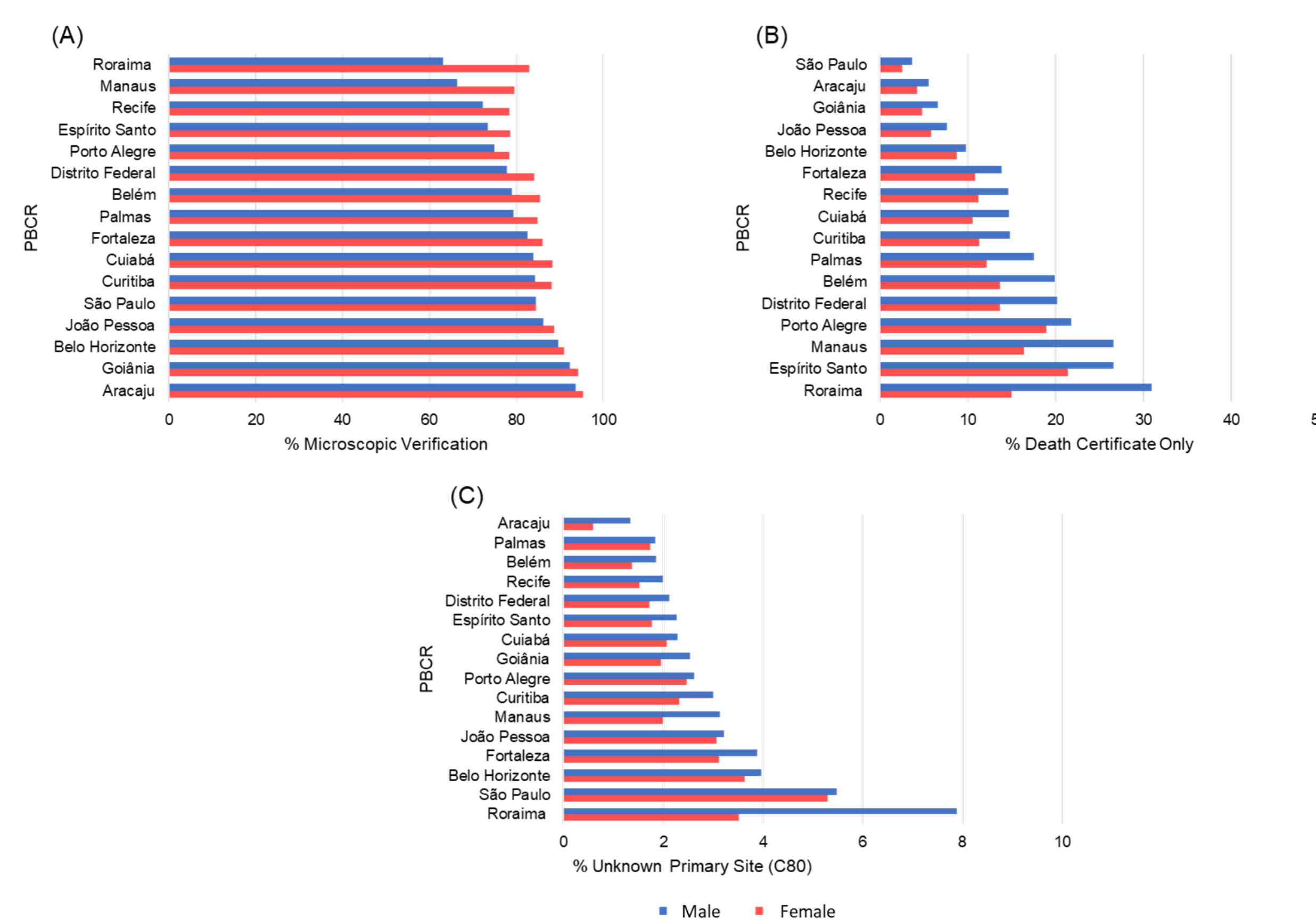


Figure 2. Proportion of (A) microscopic verification (%MV), (B) proportion of death certificate only (%DCO), and (C) proportion of unknown primary site (C80), for all cancers except non-melanoma skin cancer, by Population-Based Cancer Registry and sex.

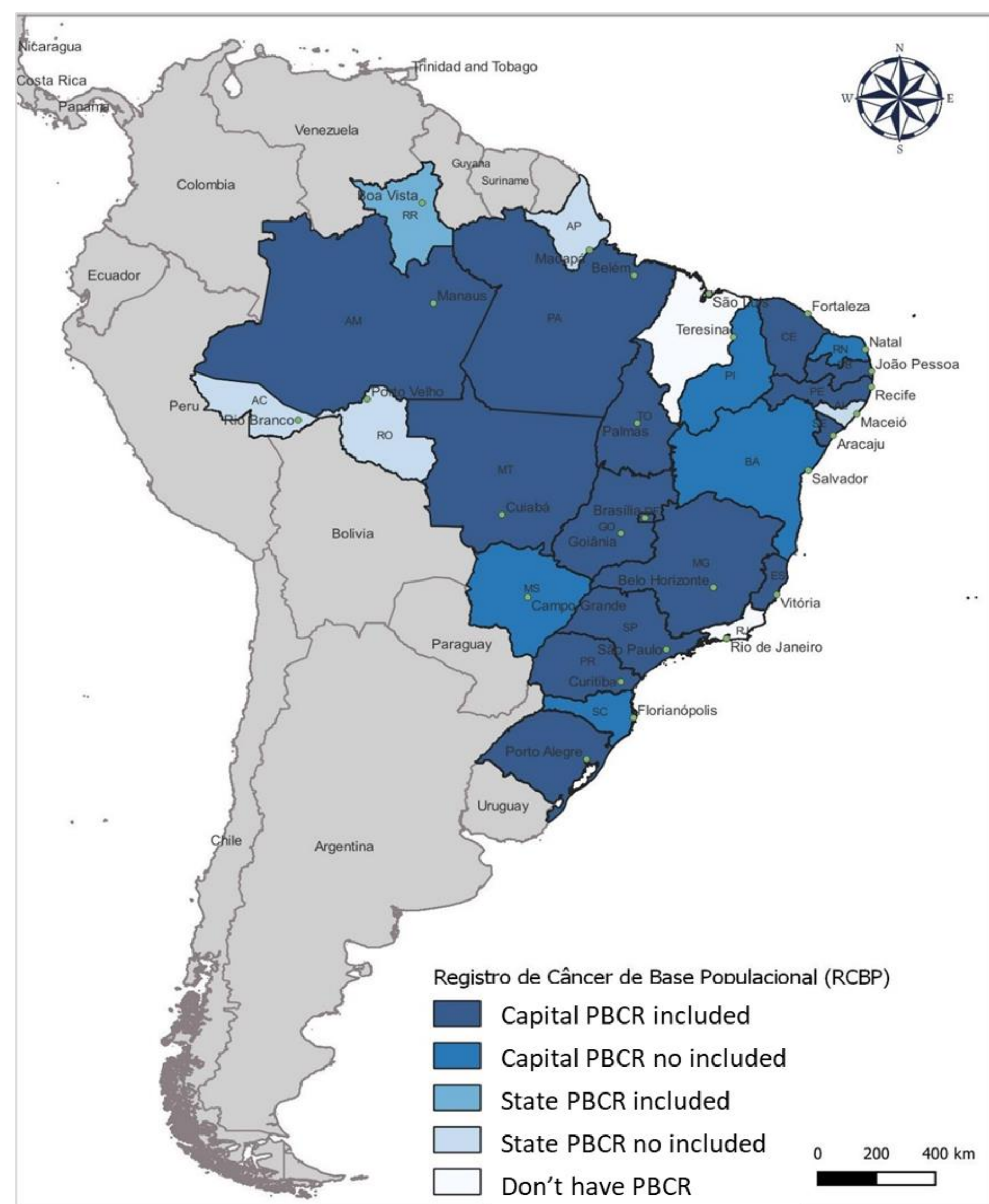


Figure 1. Geographic distribution of Population-Based Cancer Registries with state or capital coverage, included and not included in the study.

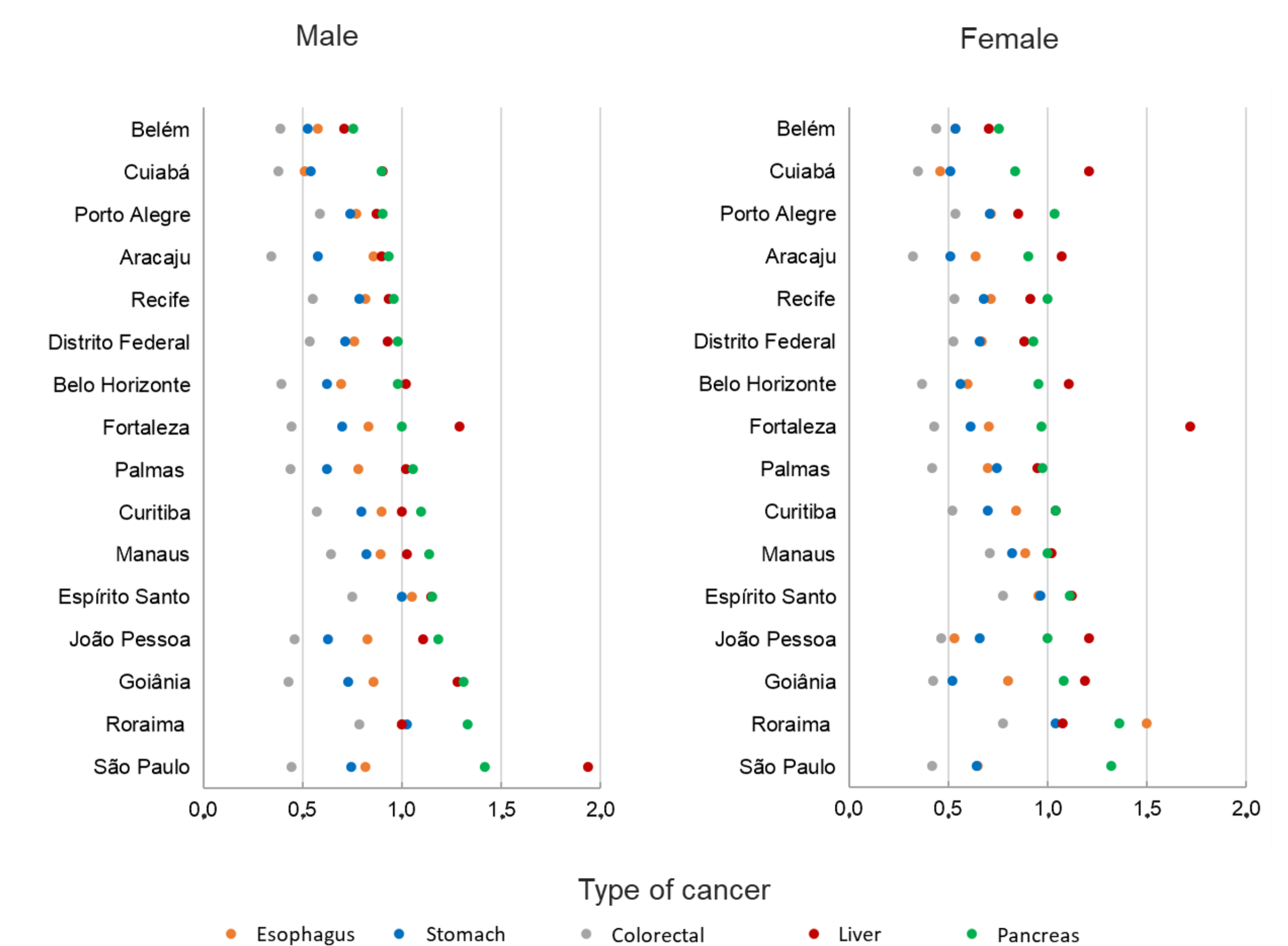


Figure 4. Comparison of mortality/incidence ratio for esophageal, stomach, colorectal, liver, and pancreas cancers by sex and Population-Based Cancer Registry.

Conclusion:

The Brazilian cancer registries studied meet the international comparability criteria, but half presented indexes below the expected for the criteria of validity and completeness for highly lethal tumors such as the liver and pancreas, in addition to the long delay in the timely dissemination of incidence data. It's important to ensure the activity and stability of PBCRs in Brazil, which continue to be a tool to monitor the incidence and cancer control policies in a country.