

The Chinese CRVS system- move forward to the universal coverage

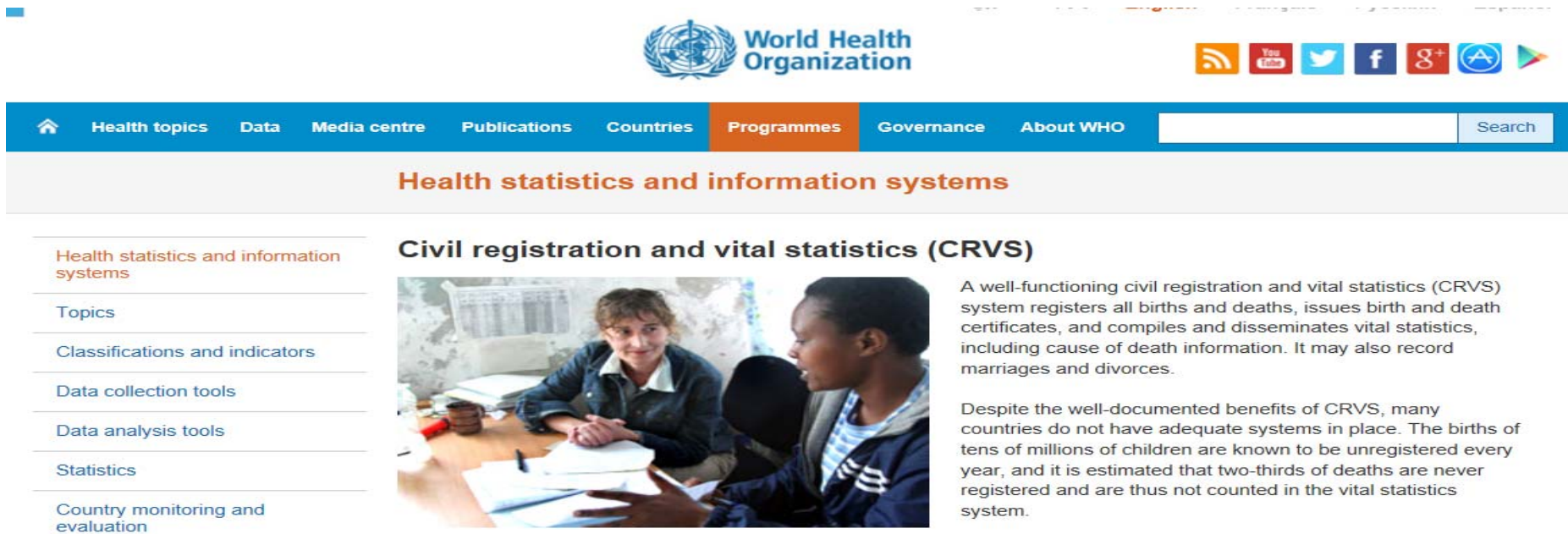
**CAI, Yue
CHSI, NHFPC**

Content

- Background.
- Introduction of Chinese Civil Registration and Vital Statistics System.
- The National Population Basic Information Database.
- Multi-source mortality data comparison.

Background

- Vital Registration information are records of population dynamic events which should be universal covered, continuous, permanent and legal. The core information of Vital Registration include birth registration and death registration (include cause of death).
- Reliable vital statistics are important for national authorities to optimize the allocation of health resources and formulate social and economic development plan.



The screenshot displays the WHO website's navigation and content for CRVS. At the top, the WHO logo and name are visible, along with social media icons for RSS, YouTube, Twitter, Facebook, Google+, and a mobile app icon. The main navigation bar includes links for Home, Health topics, Data, Media centre, Publications, Countries, Programmes (highlighted), Governance, and About WHO, followed by a search bar. Below this, the page title is 'Health statistics and information systems'. A left-hand sidebar lists various sub-topics: Health statistics and information systems, Topics, Classifications and indicators, Data collection tools, Data analysis tools, Statistics, and Country monitoring and evaluation. The main content area features the heading 'Civil registration and vital statistics (CRVS)' above a photograph of two women in a meeting. To the right of the photo, a text block explains that a well-functioning CRVS system registers all births and deaths, issues certificates, and compiles vital statistics, including cause of death information. It also notes that despite the benefits, many countries lack adequate systems, with tens of millions of children unregistered annually and two-thirds of deaths never recorded.

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Civil registration and vital statistics (CRVS)



A well-functioning civil registration and vital statistics (CRVS) system registers all births and deaths, issues birth and death certificates, and compiles and disseminates vital statistics, including cause of death information. It may also record marriages and divorces.

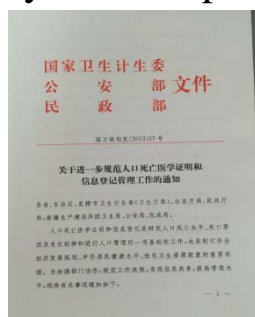
Despite the well-documented benefits of CRVS, many countries do not have adequate systems in place. The births of tens of millions of children are known to be unregistered every year, and it is estimated that two-thirds of deaths are never registered and are thus not counted in the vital statistics system.

Death Registration

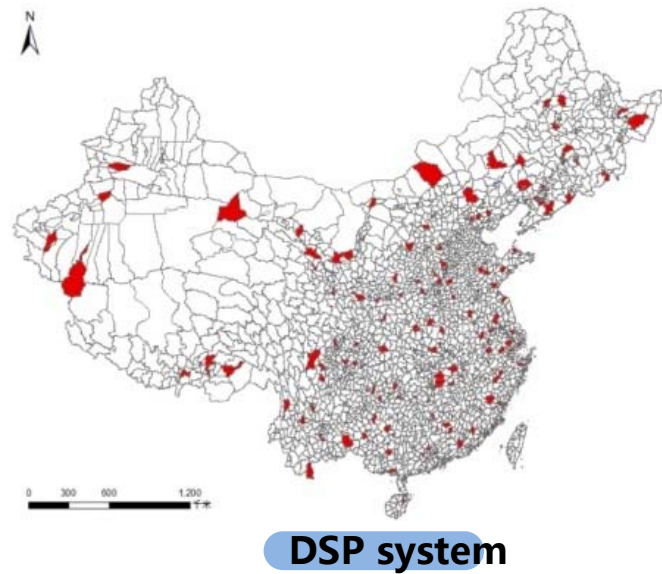
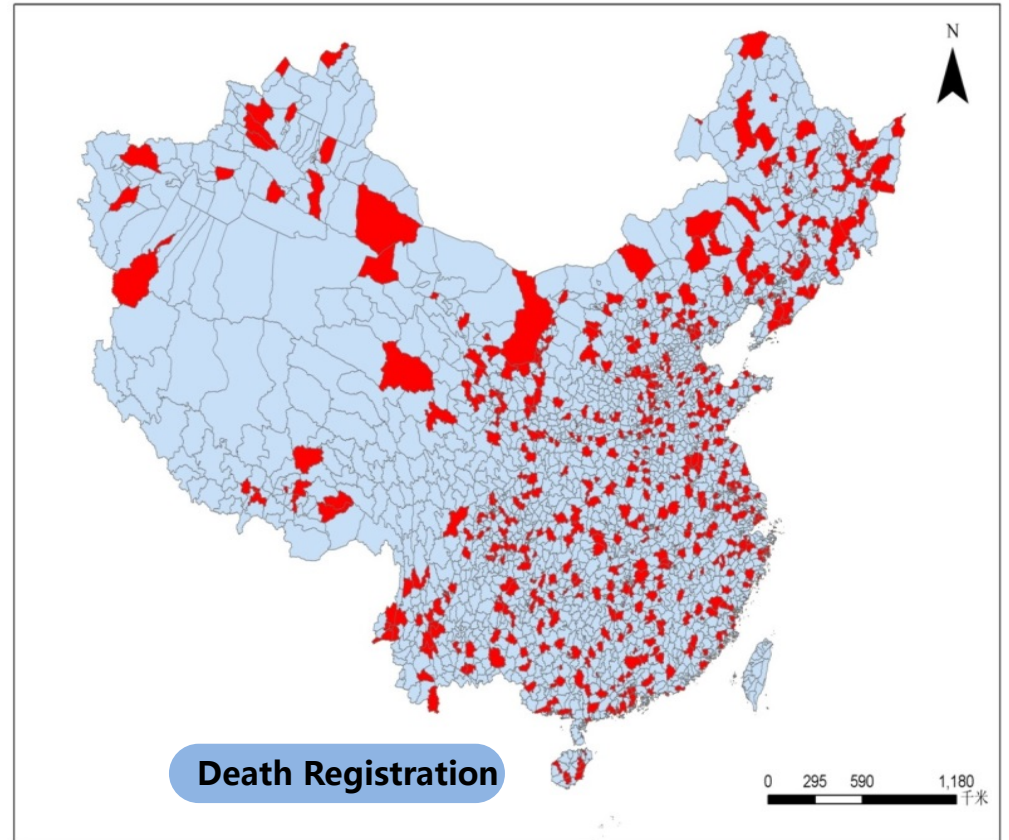
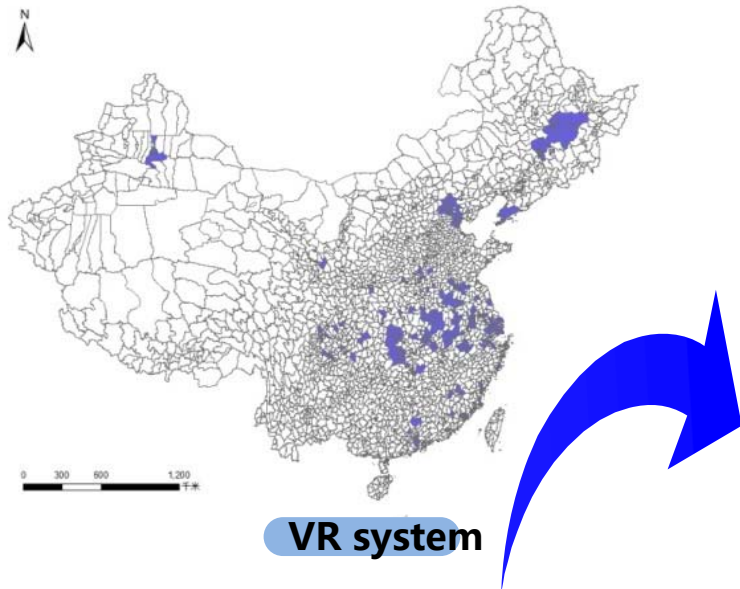
- **HISTORY:**
- **Vital Registration system:** The vital registration system was established early in the 1950s, collecting death data (including cause of death) in Beijing, Shanghai, Nanjing and other 13 cities. In 2000, the system has covered 15 cities, 21 middle/small cities and 90 counties covering about 11 million people; by 2012, the system has expanded to include 181 districts and 138 counties covering about 230 million people.
- **Disease Surveillance Points system:** Established in 1978 with two surveillance points in Beijing. In 1990, the number of points had increased to 145 covering approximately 10 million people. In 2004, the system has expanded to include 161 points covering 73 million people.

Death Registration

- **Development:**
- **Death Registration system:**
 - In 2013, National Health and Family Planning Commission, Ministry of Public Security and Ministry of Civil Affair jointly issued a notification on strengthening the mortality information reporting and management.
 - This notification standardized the format and reporting process of death certificates, required all hospitals should report death certificate information not only for those dead in hospitals but also for those dead at home within the administrated area.
 - defined the death medical certificate is the evidence for the cancellation of household registration and cremation.
 - In view of the high proportion of deaths at home-accounting for 70% of total death toll, as well as the complexity of verbal autopsy and coding, the CHSI and CDC jointly established **the Death Surveillance Sits (DSS) in 2013 covering 605 districts/counties** which is provincial representative.
 - Annual investment of 35 million special funds from Chinese government is allocated to ensure the accuracy and completeness of death data collected by this Death Surveillance Sits System.



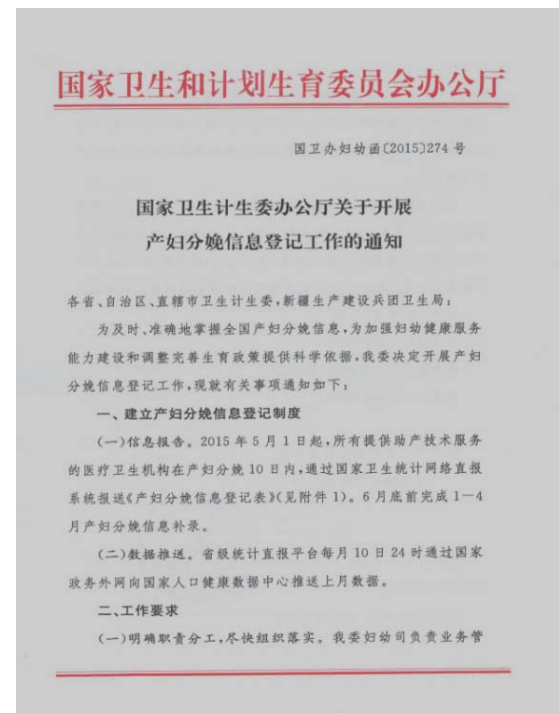
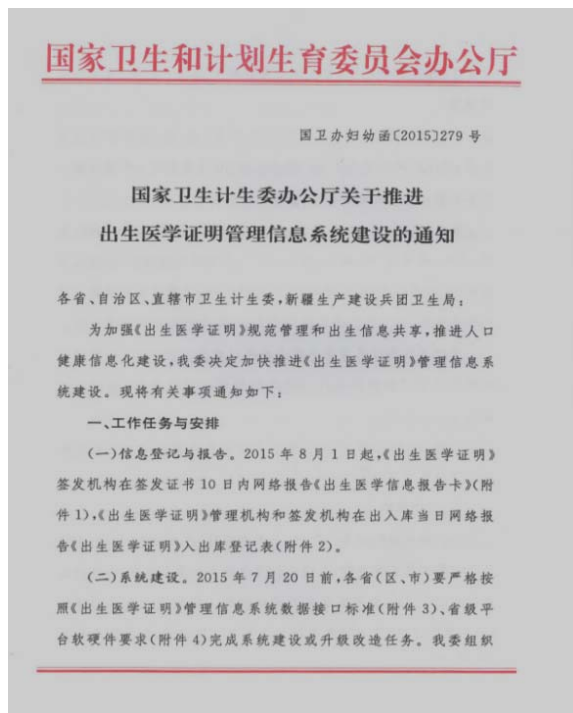
Death Registration



Birth Registration

- **Birth Registration**

- Two datasets were built: maternity information datasets & birth medical certificate information datasets ever since 2015.
- The birth medical certificate information and maternity information reflect the birth condition and the maternity condition of our country respectively, the two sources of datasets reinforce and complement with each other, and accelerate the accuracy of information and comprehensiveness of birth registration in China.



Population Registration

- Population Registration Datasets:

- In order to improve population service and management, the former Population and Family Planning Commission established a database covering individual information of all Chinese population by the family planning team covering all streets and villages since 2009.
- Data collected by this system covered three types of information, namely, the basic demographic information of the population, women's reproductive history and death information.
- Street and village based family planning officers paid monthly visits to households to update the birth, death and fertility information and reported to the provincial CHSIs.
- The provincial CHSIs exchanged the information to the Chinese Population Health Data Center, CHSI every half year.

The National Population Basic Information Database

- In order to understand the exact number of Chinese population, strengthen the population data sharing among different ministries, the National Population Basic Information Database has been built ever since 2014.
- The National Population Basic Information Database is one of the five key information constructions of the national government.
- Five ministries have participated in this construction, including the ministry of public security, the ministry of education, the ministry of civil affairs, the ministry of human resources and social security as well as the national health and family planning commission.
- National health and family planning commission is responsible for comparing the information of births, deaths and total population in the National Population Basic Information Database.

The National Population Basic Information Database

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国家人口基础信息库

The National Population Basic Information Database

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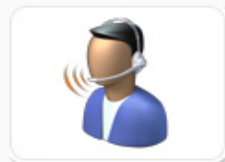
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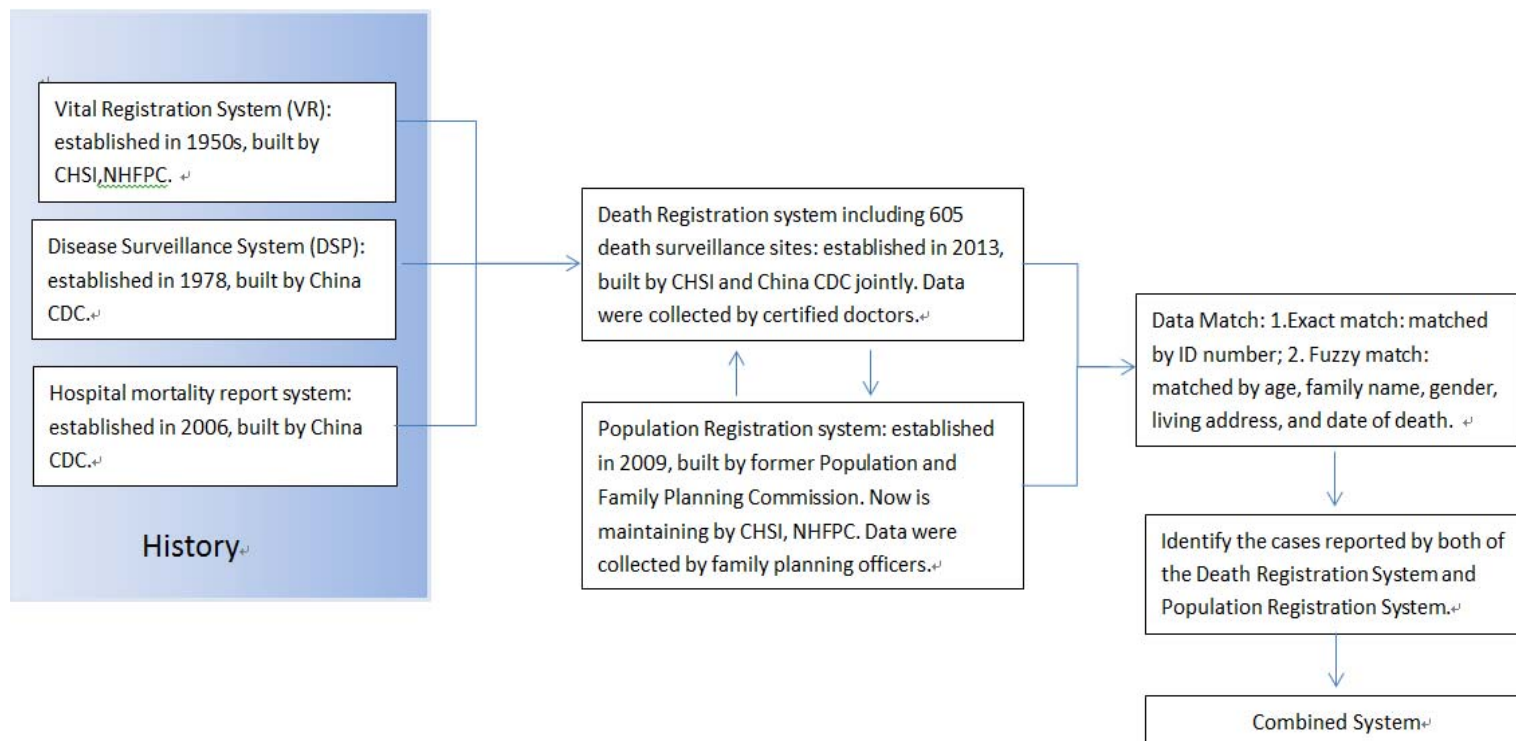
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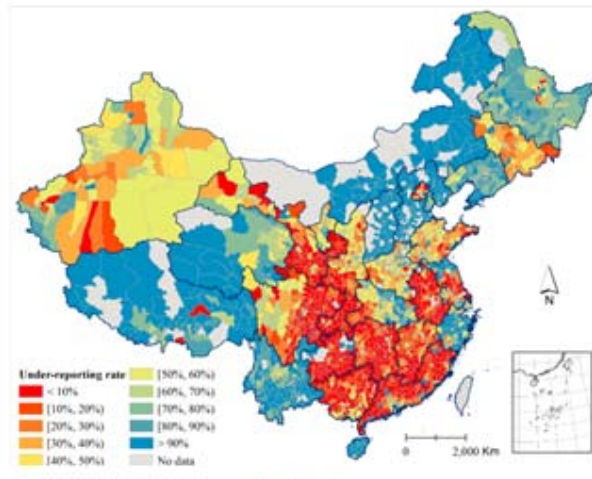
Multi-source mortality data comparison

- **Two data sources:** Population Registration system & Death Registration system.
 - **Capture-recapture:** The number of deaths was calculated via two-sample capture-recapture estimation using Chapman's method, which assumes that the cases in each registry are part of the same underlying population and that cases have been incompletely captured.
 - **Data match:** To obtain the number of overlapping cases in the two systems, the following two steps were used: 1) exact match: mortality captured in the two systems was matched by ID number; and 2) probabilistic match: cases without ID number were matched probabilistically. A probabilistic match was made basing on the following five characteristics: family name, gender, year of birth, death date and resident county/district code.

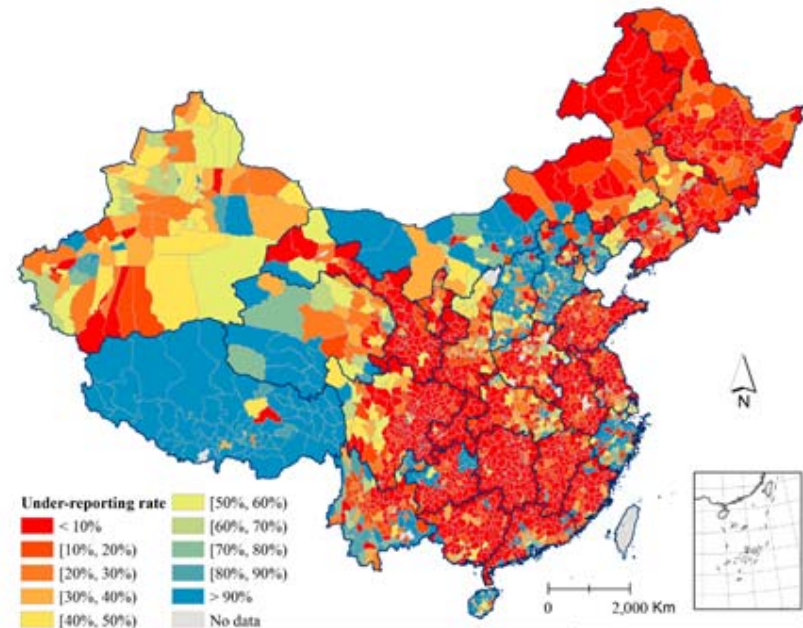


Multi-source mortality data comparison

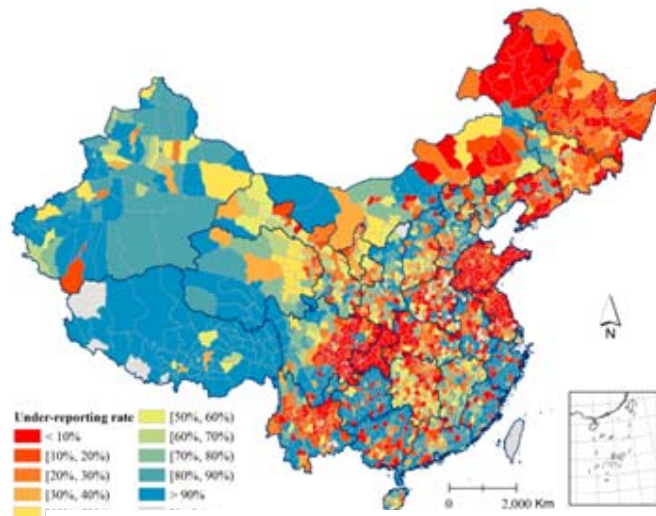
Percentages of counties with the reporting rates higher than 80%



Population Registration System



Combined System

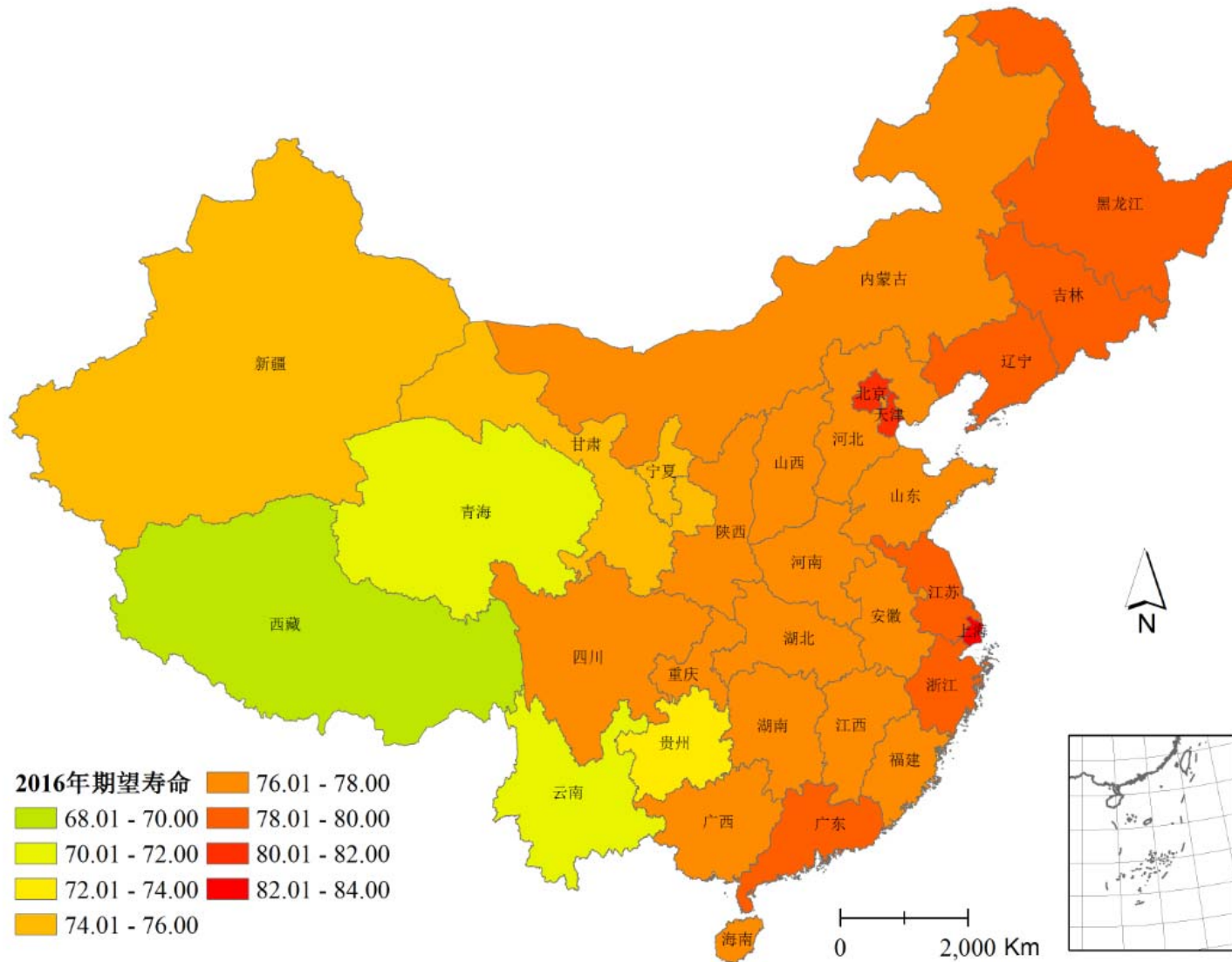


Death Registration System

Multi-source mortality data comparison

Age [⌘]	National [⌘]				605 DSS [⌘]			
	Mortality (%) [⌘]	Under-reporting rate (%) [⌘]			Mortality (%) [⌘]	Under-reporting rate (%) [⌘]		
		Death Registration System [⌘]	Population Registration System [⌘]	Combined [⌘]		605 DSS [⌘]	Population Registration System [⌘]	Combined [⌘]
Total [⌘]	6.78 [⌘]	42.79 [⌘]	42.97 [⌘]	13.02 [⌘]	6.75 [⌘]	13.87 [⌘]	41.82 [⌘]	5.80 [⌘]
(95% CI) [⌘]	(6.778,6.782) [⌘]	(42.76,42.81) [⌘]	(42.95,43.00) [⌘]	(13.00,13.03) [⌘]	(6.751,6.755) [⌘]	(13.841,13.91) [⌘]	(41.80,41.84) [⌘]	(5.77,5.83) [⌘]
Infant [⌘]	9.62 [⌘]	74.01 [⌘]	74.91 [⌘]	62.83 [⌘]	9.51 [⌘]	67.58 [⌘]	75.02 [⌘]	57.45 [⌘]
(95% CI) [⌘]	(9.34, 9.90) [⌘]	(73.21,74.75) [⌘]	(74.45,75.34) [⌘]	(61.70,63.90) [⌘]	(9.12,9.90) [⌘]	(66.21,68.85) [⌘]	(74.38,75.61) [⌘]	(55.64,59.12) [⌘]
Age0-4 [⌘]	12.87 [⌘]	65.95 [⌘]	70.74 [⌘]	49.95 [⌘]	12.98 [⌘]	57.87 [⌘]	72.71 [⌘]	42.08 [⌘]
(95% CI) [⌘]	(12.66,13.08) [⌘]	(65.37,66.51) [⌘]	(70.33,71.14) [⌘]	(49.10,50.77) [⌘]	(12.71,13.25) [⌘]	(56.97,58.74) [⌘]	(72.13,73.27) [⌘]	(40.90,43.26) [⌘]
Age5-14 [⌘]	0.42 [⌘]	54.09 [⌘]	57.10 [⌘]	33.00 [⌘]	0.43 [⌘]	50.82 [⌘]	54.13 [⌘]	32.59 [⌘]
(95% CI) [⌘]	(0.417,0.423) [⌘]	(53.80,54.38) [⌘]	(56.83,57.36) [⌘]	(32.54,33.46) [⌘]	(0.425,0.435) [⌘]	(50.29,51.34) [⌘]	(53.74,54.51) [⌘]	(31.86,33.30) [⌘]
Age15-44 [⌘]	1.08 [⌘]	49.55 [⌘]	49.87 [⌘]	25.65 [⌘]	1.04 [⌘]	34.72 [⌘]	47.65 [⌘]	20.02 [⌘]
(95% CI) [⌘]	(1.078,1.082) [⌘]	(49.48,49.62) [⌘]	(49.80,49.94) [⌘]	(25.54,25.76) [⌘]	(1.038,1.042) [⌘]	(34.60,34.85) [⌘]	(47.57,47.73) [⌘]	(19.86,20.17) [⌘]
Age45-64 [⌘]	5.22 [⌘]	37.75 [⌘]	43.59 [⌘]	17.97 [⌘]	5.20 [⌘]	11.88 [⌘]	42.74 [⌘]	5.31 [⌘]
(95% CI) [⌘]	(5.218,5.222) [⌘]	(37.72,37.78) [⌘]	(43.57,43.62) [⌘]	(17.93,18.00) [⌘]	(5.198,5.202) [⌘]	(11.85,11.91) [⌘]	(42.71,42.76) [⌘]	(5.28,5.35) [⌘]
65 and above [⌘]	46.28 [⌘]	34.06 [⌘]	37.75 [⌘]	12.86 [⌘]	46.25 [⌘]	6.7 [⌘]	34.42 [⌘]	4.6 [⌘]
(95% CI) [⌘]	(46.272,46.288) [⌘]	(34.05,34.07) [⌘]	(37.74,37.76) [⌘]	(12.84,12.87) [⌘]	(46.249,46.251) [⌘]	(6.62,6.78) [⌘]	(34.27,34.57) [⌘]	(4.59,4.61) [⌘]

Estimation of life expectancy of Chinese residents



Estimation of life expectancy of Chinese residents in different provinces

- The average life expectancy in Beijing, Tianjin and Shanghai has reached and is even higher than the life expectancy of Norway, New Zealand and Britain.(areas in red color)
- The average life expectancy of the areas in orange red has reached the life expectancy of the United States, Czech and Croatia.
- The average life expectancy of the areas in orange is equivalent to the life expectancy of countries like Mexico, Argentina and Turkey.
- The average life expectancy of the areas in yellow and green is close to the life expectancy of countries in southeast Asian, and the average life expectancy of Tibet is equal to Nepal.

---WHO 《World Health Statistics 2016》

Suggestions

- CRVS Legislation.
- Increase Investment.
- Improve Data quality.
- Capacity Build.
- Improve the National Population Basic Information Database, Realize the function of multi-source data comparison among different ministries.

Thank you