



China Data Institute

chinadatacenter.net
China-data-online.org

A Digital China In Time and Space

China Geo-Explorer

(Version III)

About China Geo-Explorer

“China Geo-Explorer” offers the web-based spatial data service that provides easy access to rich collections of unique, authoritative, and comprehensive information from government statistics, population and economic censuses, and many other data sources in a spatially integrated system with many powerful functions for exploratory spatial data analysis. Unlike many other GIS systems and mapping tools, China Geo-Explorer are compatible with most web browsers and doesn’t require advanced GIS skills. China Geo-Explorer has been subscribed by many university libraries and used for research and teaching in population, economy, health, environment, religion and many other fields.

Birmingham



FIU



Dartmouth



Cornell



Duke



Tufts



EMORY



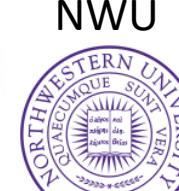
ASU



GWU



Harvard



NWU



Princeton



MIT



Oxford



Boston



Columbia



California



Middlebury



Data Sources



- **Administrative Boundary Maps** (province, city, county and township)
 - 2000
 - 2010
 - 2000-2010
- **Gov't Statistics**
 - Province Statistics (1949 -)
 - City Statistics (1996 -)
 - County Statistics (1997 -)
- **Population Census** (1953、1964、1982、1990、2000、2010、2020)
- **Industrial Census** (1995)
- **Basic Unit Census** (2001)
- **Economic Census** (2004、2008、2013、2018)
- **Establishments** (> 7 millions records)
- **Geography and Environment**
 - Land use data
 - Nighttime light data

User Interface

The interface of **China Geo-Explorer** is composed of three parts: (1) the main menus on the top bar; (2) the left side area for data selection and reports; and (3) the right side area for spatial tools and map display. The top menus offer data selection, theme map, GIS map export and some other functions. Users can select data by administrative units, geographical locations, times series, or establishments for spatiotemporal analysis. It also allows users to upload their own data for data analysis with other data in the system or making maps.

Administrative Unit – Location – Times Series – Chart – Theme Map – Establishment – GIS Map Export

The screenshot illustrates the China Geo-Explorer interface with three main sections highlighted by red circles:

- Top: Main Menus**: The top navigation bar includes links for Administrative Unit, X&Y Location, Time Series, Chart, Theme Map, Establishment, GIS Map Export, and Map Library. The "Administrative Unit" link is currently active.
- Left: Data and Report Selection**: This panel contains four tabs: Single group, Multi-group, Basemap, Region, Index, and Export. Below these are sections for Base Map Selection, Regional Selection, and Index Selection. Under Index Selection, there are options for Standard Report and Customized Report, along with an "Upload your data" button. A large list of historical census data is provided, including COVID-19 Daily Cases, Census 2020, Economic Censuses from 2018 to 1995, and Basic Unit Census 2001. A "Report Export" section is also present.
- Right: Tools for Spatial Queries and Visualization**: This panel features a map of East Asia and surrounding regions. It includes various spatial analysis tools like Browse, Identify, Zoom In, Zoom Out, Point, Circle, Rectangle, Polygon, and Clear. A "Background Map" dropdown shows options for Province, State, and County. A "Boundary Layer List" panel on the right lists Province Layer (checked), Prefecture Layer, County Layer, and Township Layer.

Left: Data and Report Selection

Top: Main Menus

Right: Tools for Spatial Queries and Visualization

Main Functions

"Administrative Unit" function lets users select data by province, city, county, township or any geometric area. User can select regions manually from the left side. The spatial tools on the right side allow user to select data interactively by point, by rectangle, by circle, or by polygon. User can select a predefined report or a customized report for data export in HTM, PDF, EXCEL, or Word formats.

"XY Location" function allows users to input X Y coordinates and define spatial ranges, or radius size, for data reports. User can also use the spatial tools on the right side to select data by spatial location and ranges.

"Time Series" function provides various government statistics by province, city and city-level counties. User can select index, region and year, and export the data to a variety of formats or plot the time series data in a chart.

"Chart" function allows users to generate time series charts with yearly statistics and economic census data.

"Theme Map" function provides easy tools for online mapping, choosing from thousands of variables. User can export the maps to PDF or JPG files, ready for publication.

"Establishment" function allows users to select data from more than 7 million firm level records. User can search and select establishment by choosing province, city, county, township, zip code, or keywords and export the selected data to an Excel file.

"GIS Map Export" function provide a flexible tool for users to export selected maps and their attributes to GIS shape files.

Main Features

- Authoritative data from the National Bureau of Statistics of China
- Bilingual in English and Chinese
- Comparable data across regions and years
- Complete coverage of all regions of Mainland China (province, city, county and township)
- Spatially integrated data with GIS maps

Applications

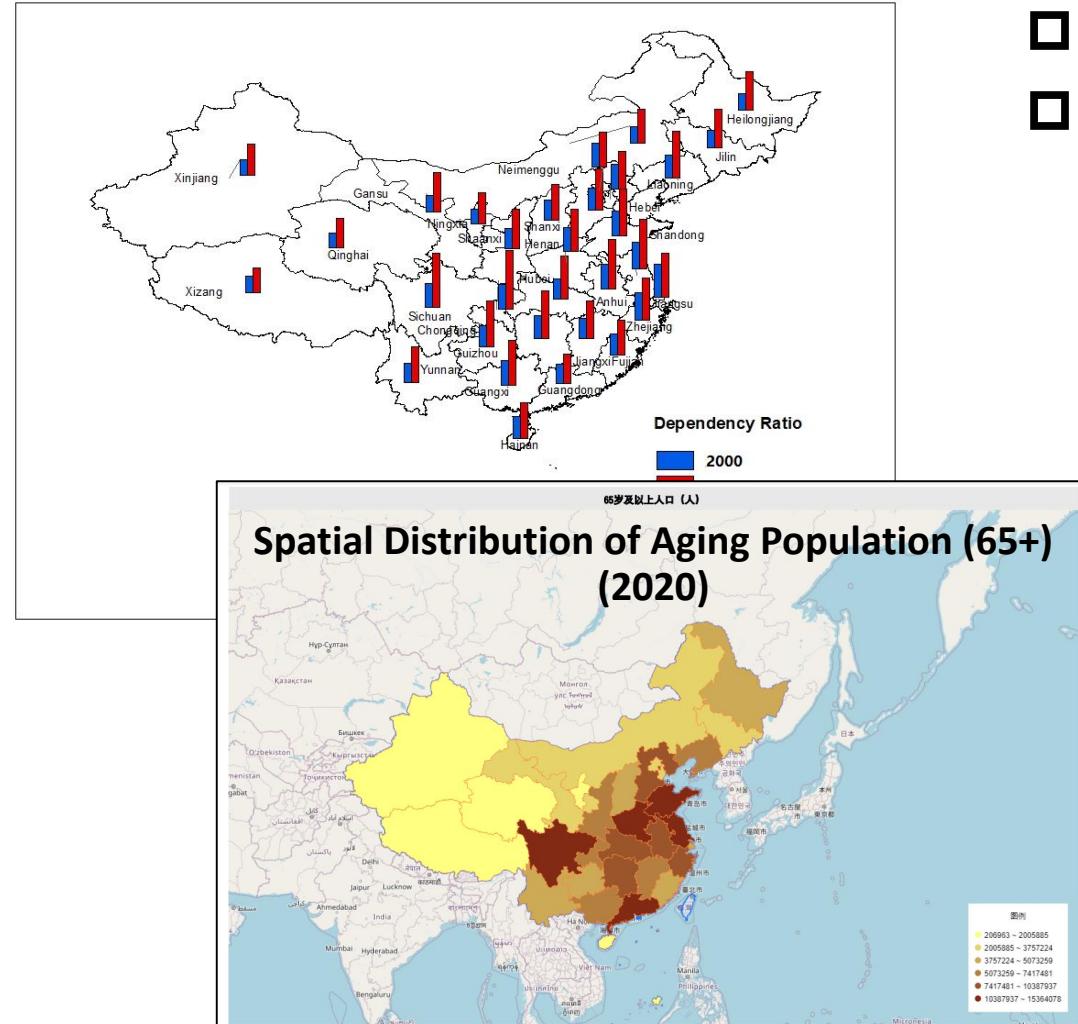
- Spatiotemporal Analysis of Population
- Spatiotemporal Analysis of Economy
- Spatiotemporal Analysis of Urban and Rural Development
- Spatiotemporal Analysis of Health
- Spatiotemporal Analysis of Environment

Spatiotemporal Analysis of Population

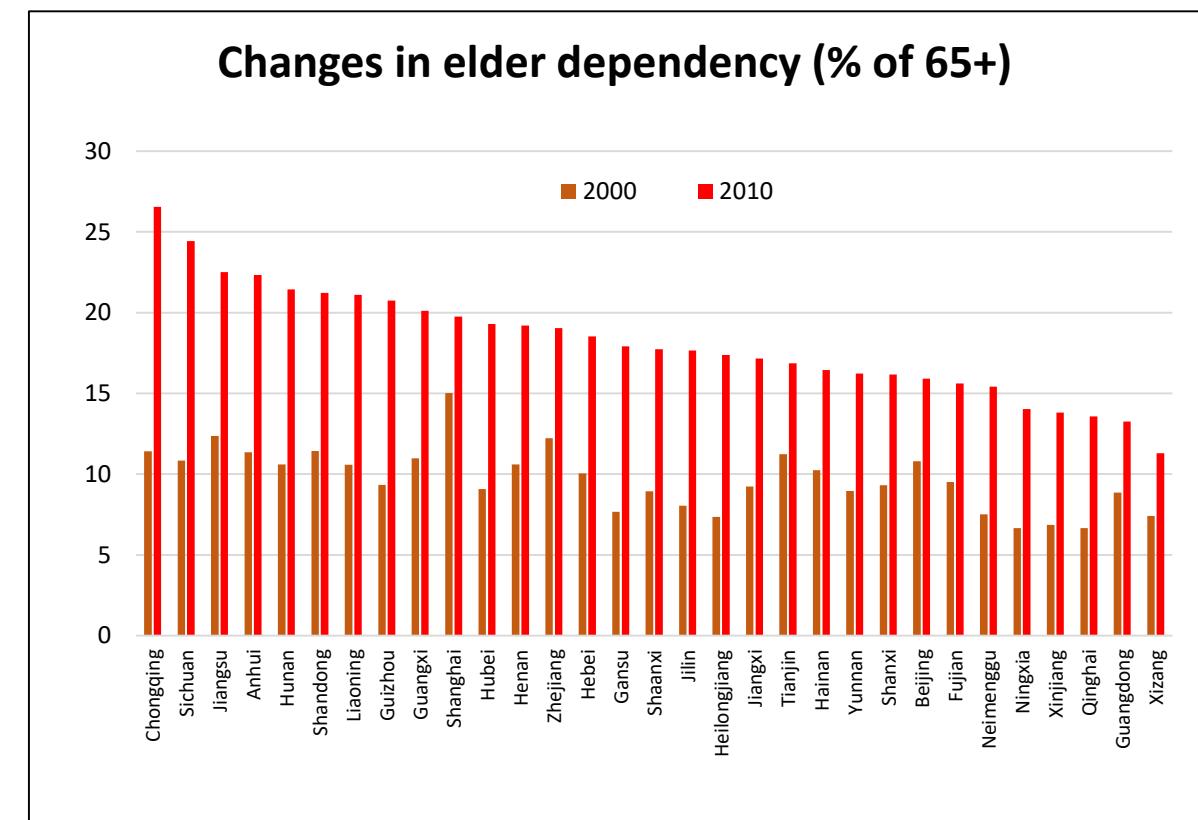
- Changes in elder dependency
- Changes in migration
- Changes in population structure
- Changes in family and housing structure

Population Analysis: Changes in Elder Dependency

Changes in elder dependency (% of 65+): 2000-2010

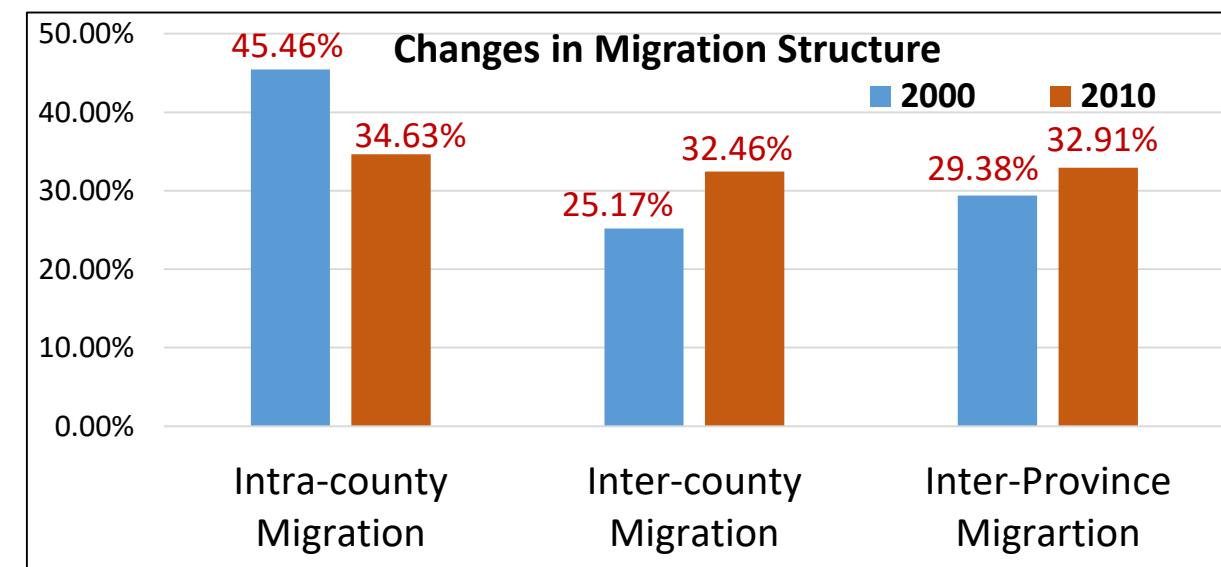
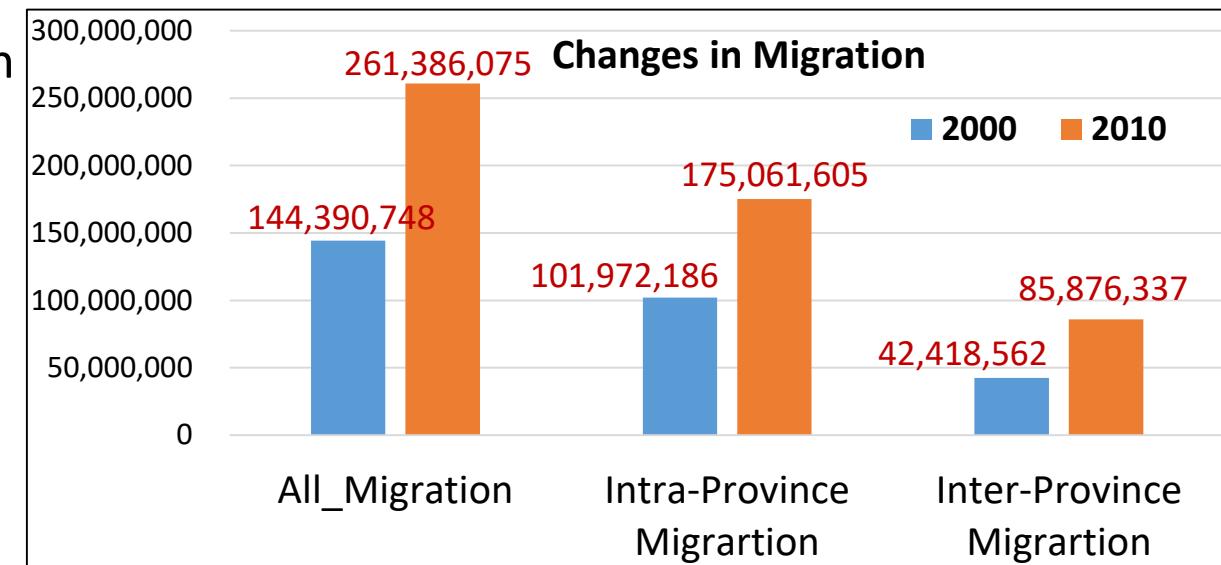
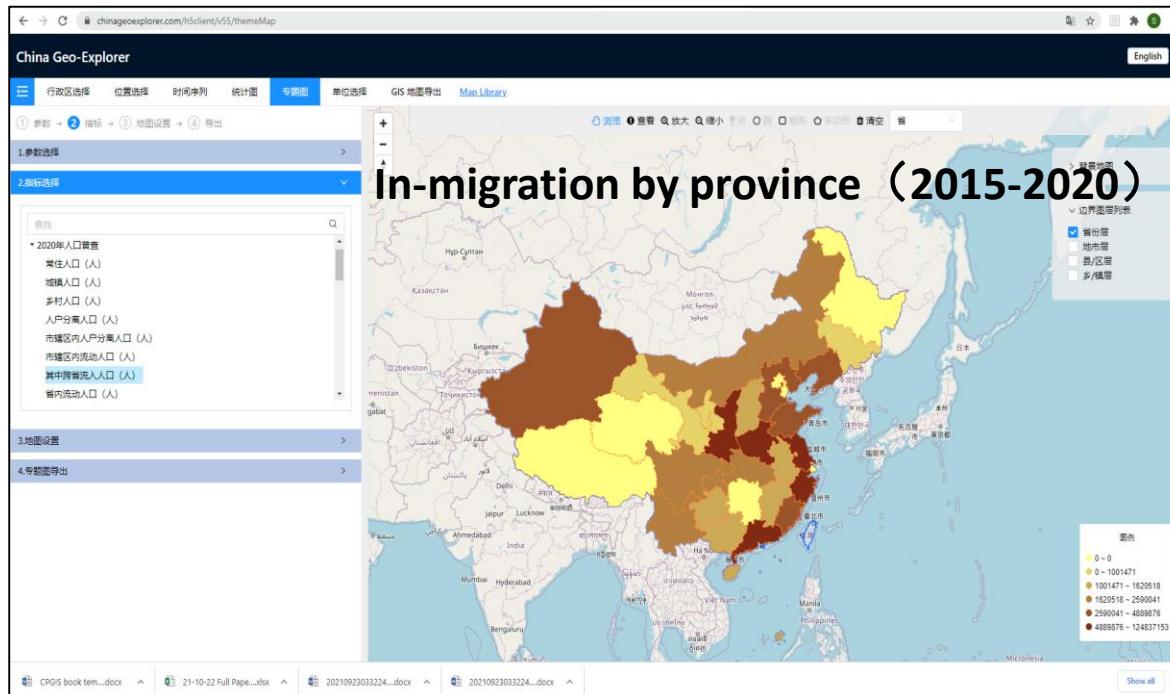


- Significant increase in elder dependency for all regions
- Higher elder dependency ratio in central and western regions
- Concentration of aging population in eastern and central regions.



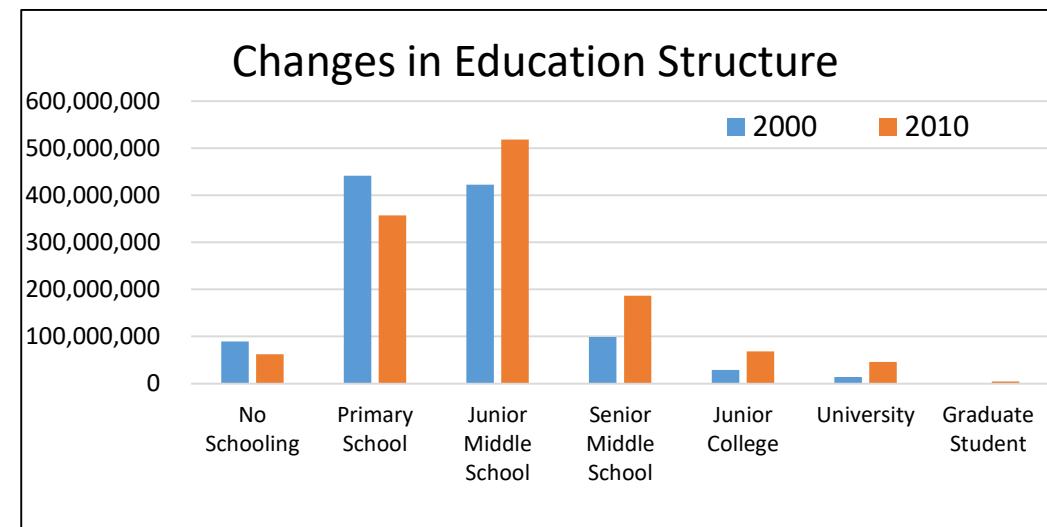
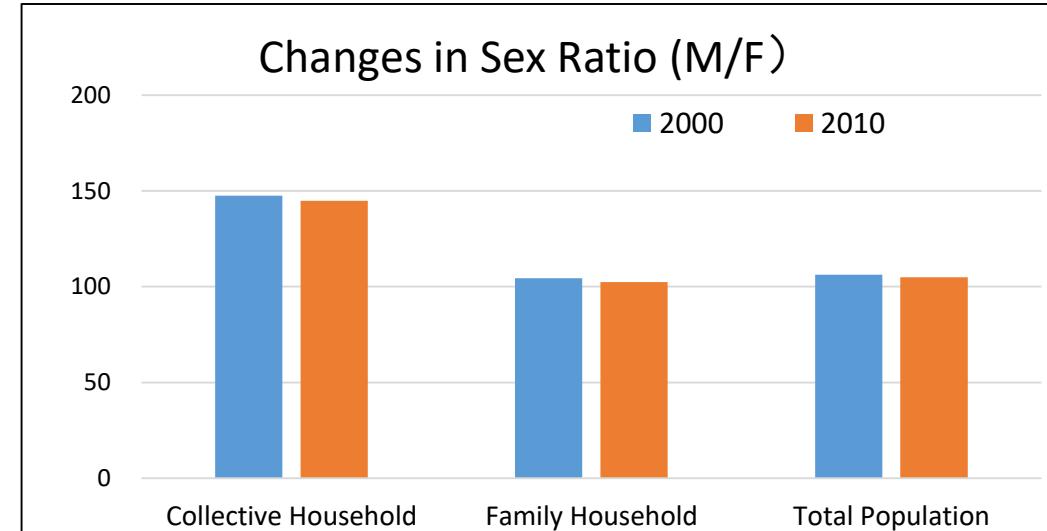
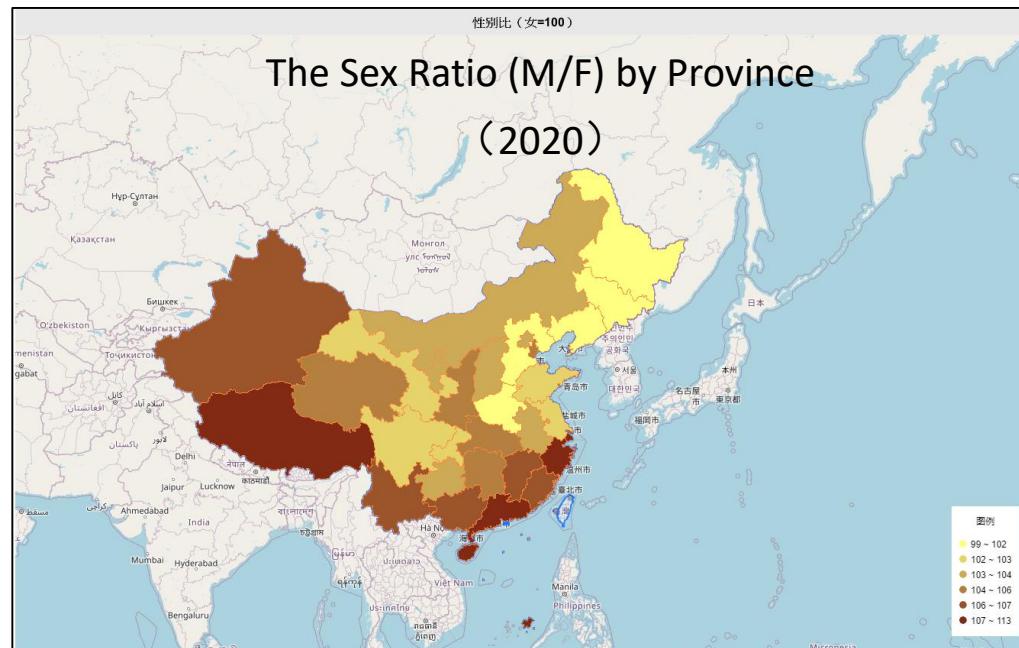
Population Analysis: Changes in Migration

- Significant increase of inter- and intra region migration
- The % of intra-county migration is declining while the % of inter-county and inter-province migration is increasing
- Eastern regions have positive net inter-province migration



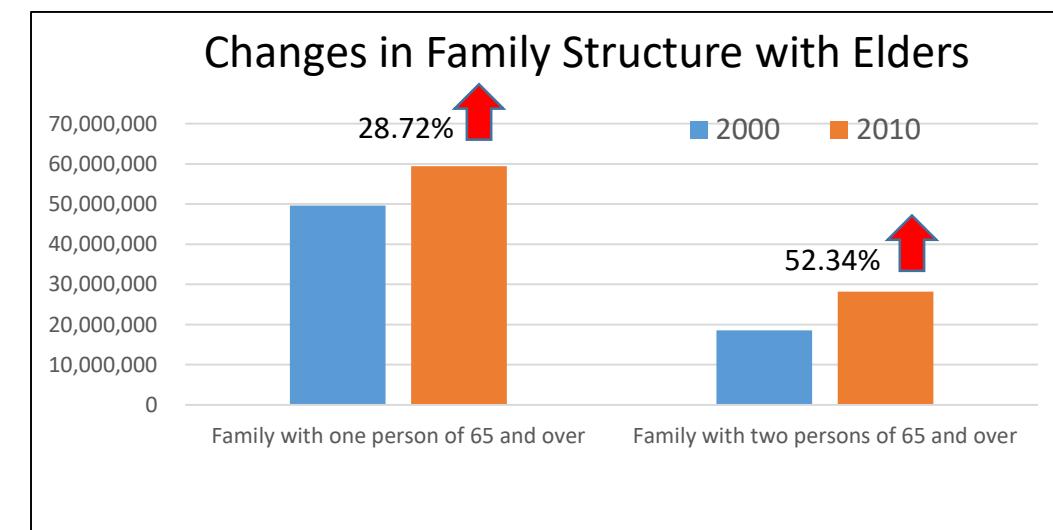
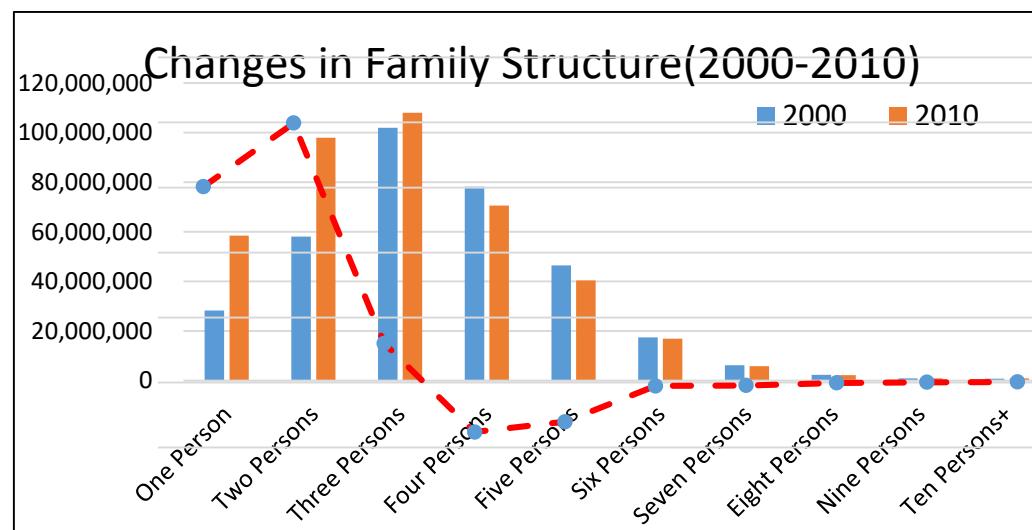
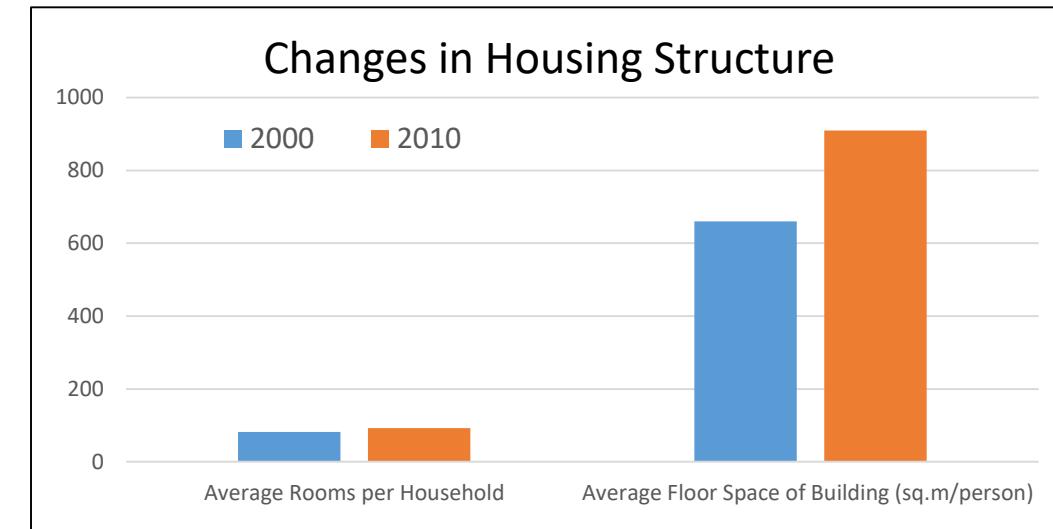
Population Analysis: Changes in population structure

- The sex ratio tends to be balanced
- The sex ratio (M/F) are significantly in southern east and western regions higher than average level
- The education in general has been improved while the number of primary students has been shrinking



Population Analysis: Changes in family and housing structure

- ❑ Significant improvement in housing status
- ❑ Shrinking family scale
- ❑ Significant increasing in the % of families with more than one elders



Spatiotemporal Analysis of Economy

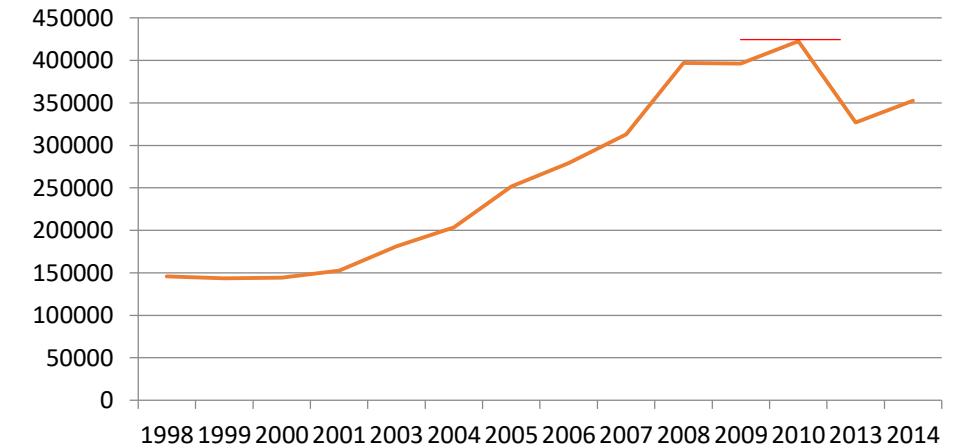
- Spatial distribution and structural Changes in Manufacture Industry
- Spatiotemporal changes in population and industrial clusters
- Spatiotemporal changes in financial structure

Spatial Distribution and Structural Changes in Manufacture

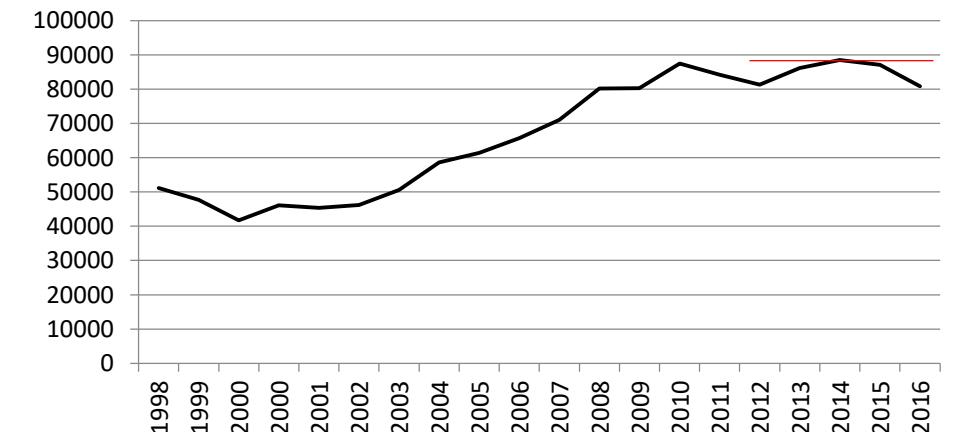
- Most manufactures are distributed in eastern and south central regions.
- The number of manufactures has been experienced rapid growth from 2000-2010 but tends to decrease since 2010
- The employment by manufactures has been experienced growth from 2000-2010 but tends to decrease since 2015



Changes in manufacture units: 1998-2014



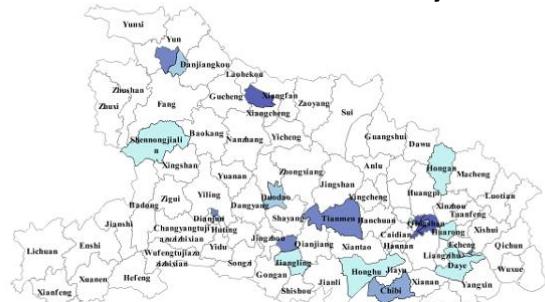
Changes in manufacture employment: 1998-2016
(Unit: One Thousands)



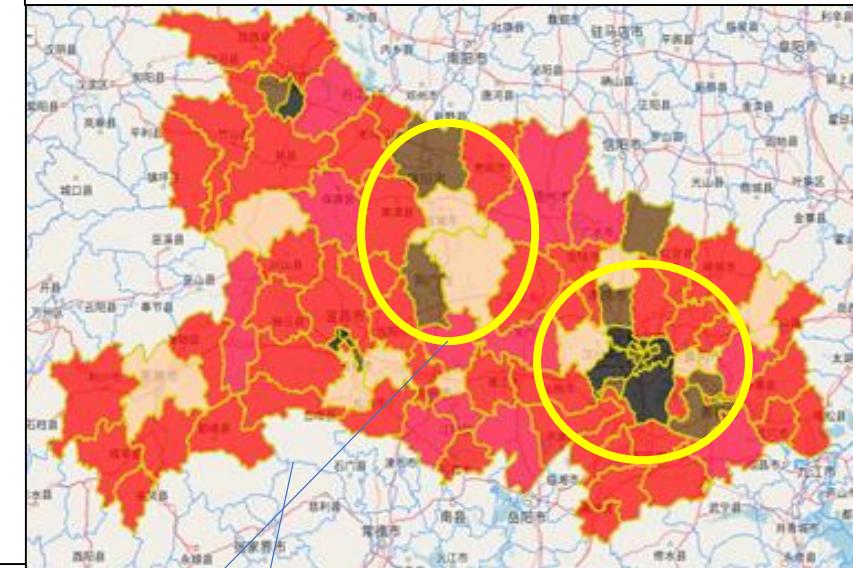
Spatiotemporal changes in population and industrial clusters (Hubei Case)

Software Development Consulting By County of Hubei, 2001

Software, 2001

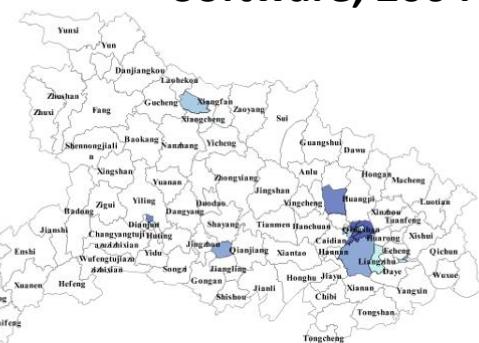


Population Change by City: 2000 - 2010



Application software services By County of Hubei, 2004

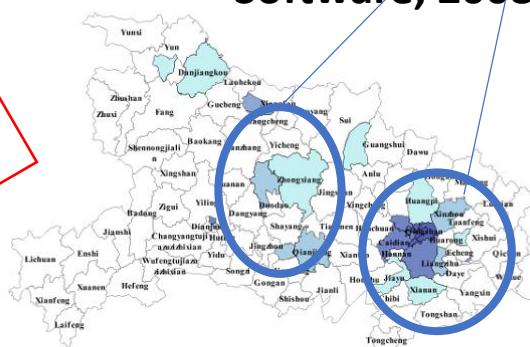
Software, 2004



China Data Center & Spatial Data Center of University of Michigan (2018). Economic Census 2004, Information Transmission, Computer Services Software, Software Industry, Application software services By County of Hubei. Statistical Map Library by China Data Center of University of Michigan. Country: China. Region: Province - Hubei. Map-ID: 8620043in_6212_442

Application software services By County of Hubei, 2008

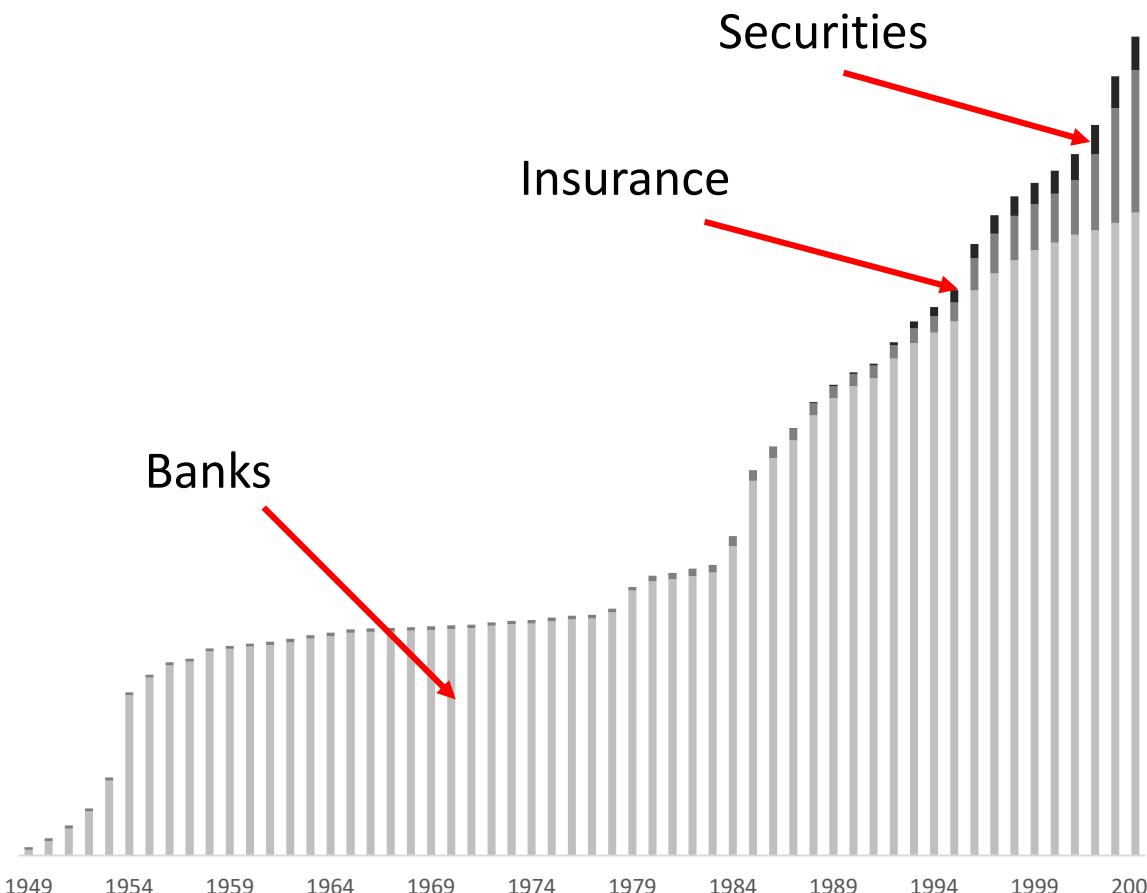
Software, 2008



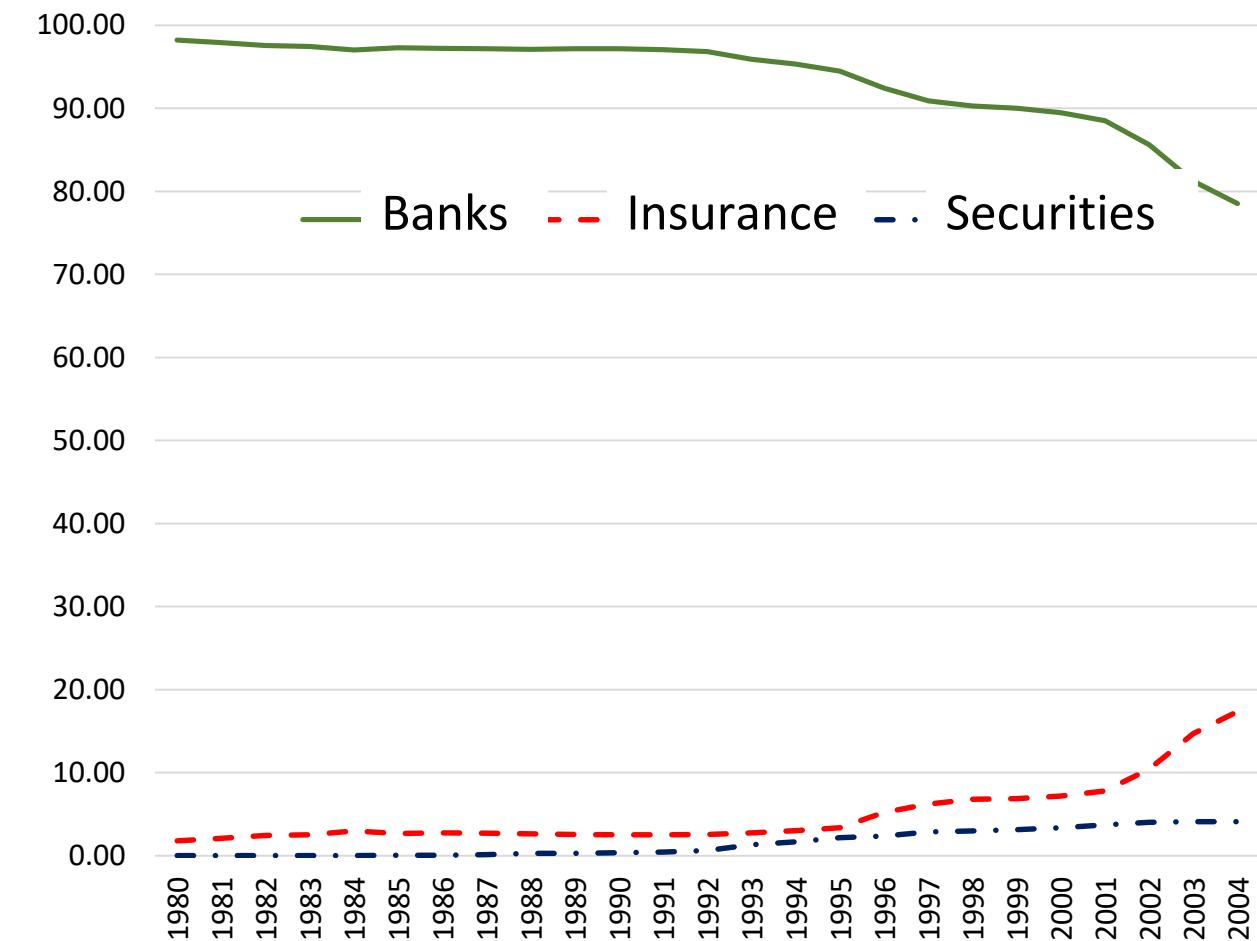
China Data Center & Spatial Data Center of University of Michigan (2018). Economic Census 2008, Information Transmission, Computer Services and Software, Software Industry, Application software services By County of Hubei. Statistical Map Library by China Data Center of University of Michigan. Country: China. Region: Province - Hubei. Map-ID: 8620083in_6212_08_1042

Spatiotemporal Changes in Financial Structure

Changes in the Number of Financial Institutions



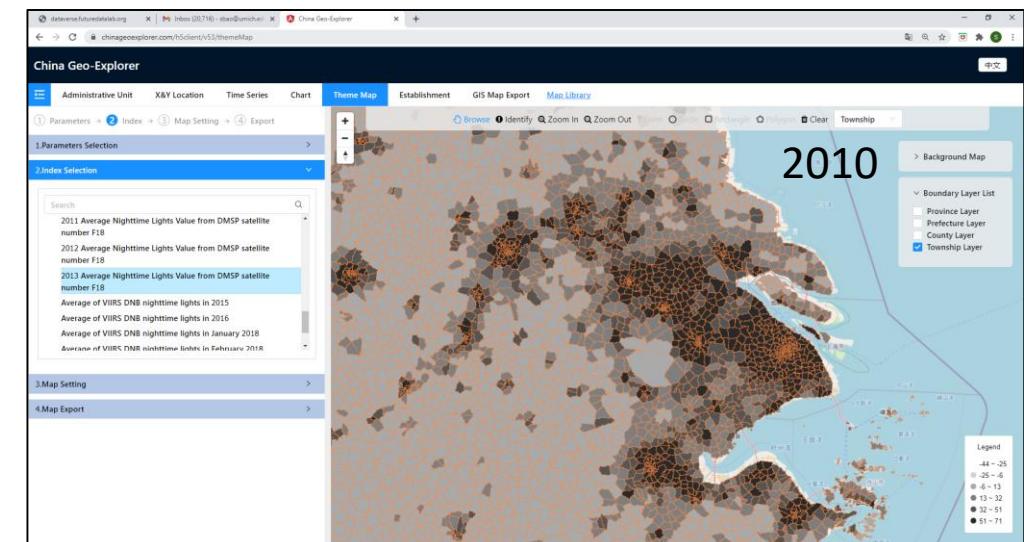
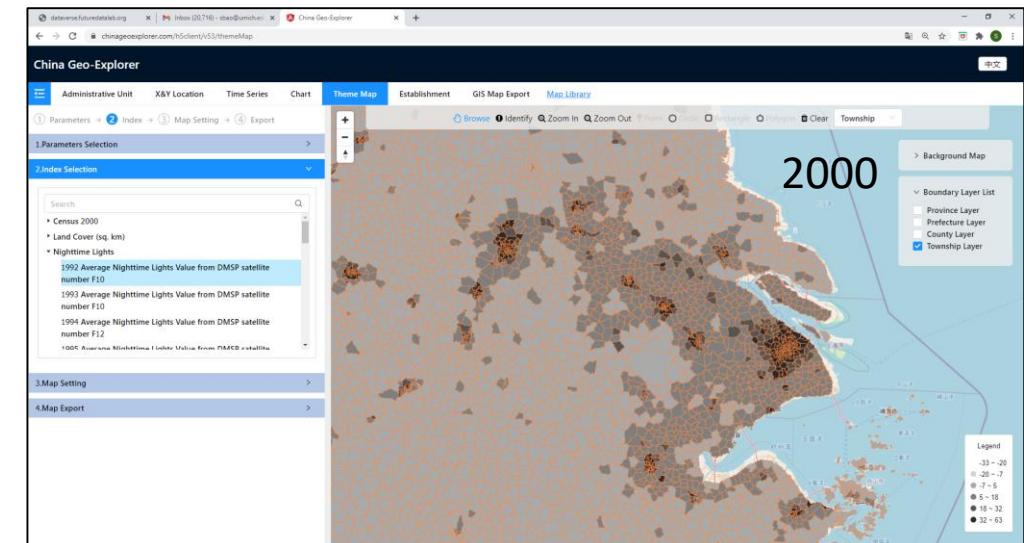
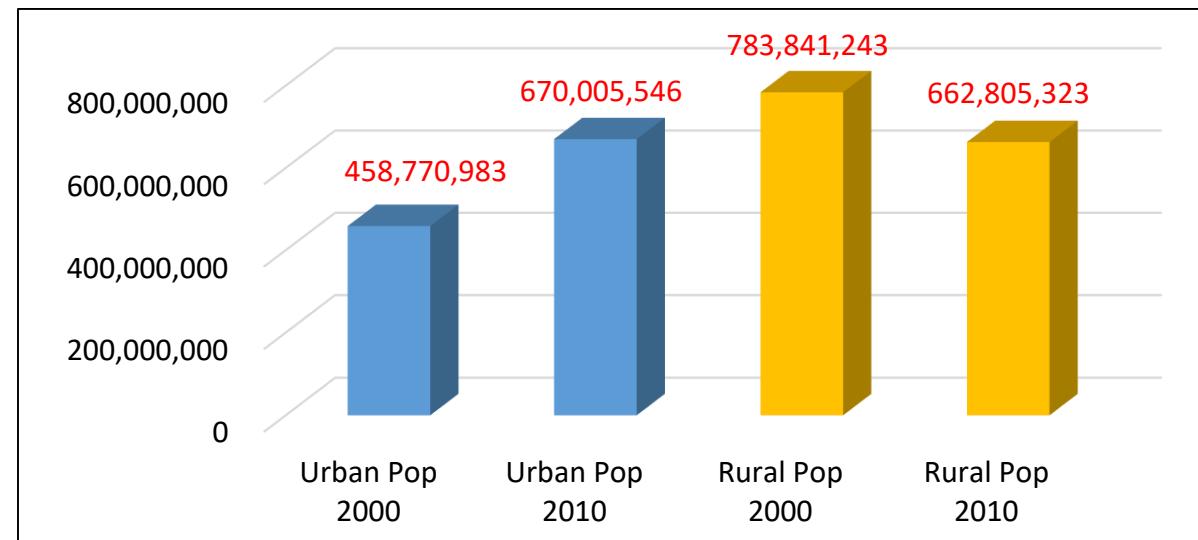
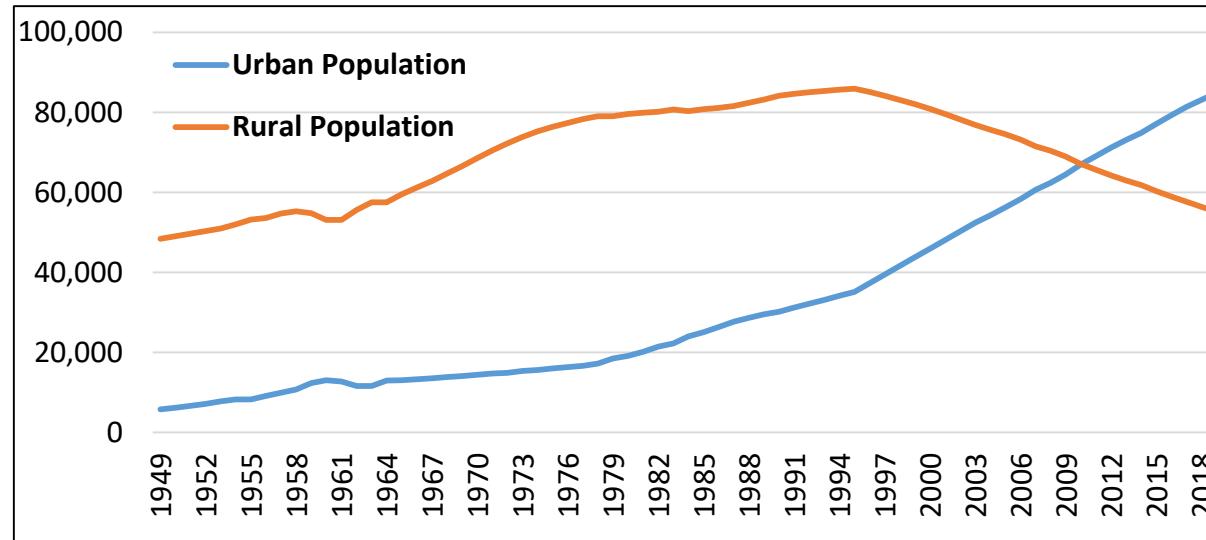
Changes in the Financial Structure (%)



Spatiotemporal Analysis of Urban and Rural Development

- Spatiotemporal changes in urban and rural areas
- Changes in urban and non-agriculture population
- Spatial distribution and structure change in rural population

Spatiotemporal Changes in Urban and Rural Areas



Changes in Urban and Non-agriculture Population

Population by Definition:

□ By household registration:

- Non-agriculture
- Agriculture

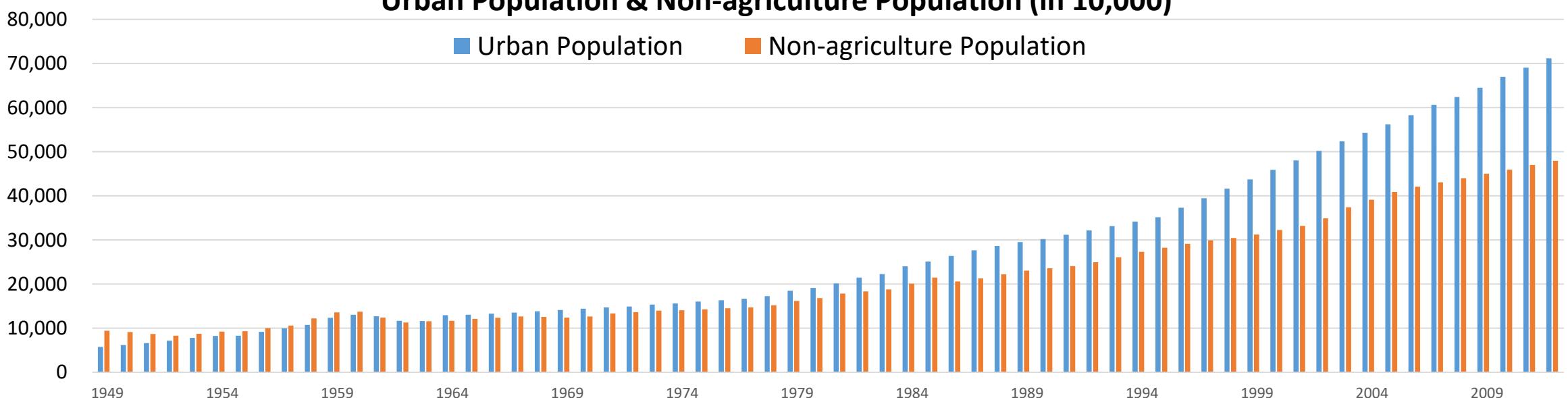
□ By place to stay

- Urban population
- Rural population

Population	Beijing	Tianjin	Shanghai	Chongqing	Shenzhen
2010 Population	19,612,368	12,938,693	23,019,196	28,846,170	10,358,381
2010 Household Registration Population	12,554,049	9,919,579	14,185,160	33,149,845	2,510,145
2010 Urban Population	16,446,857	9,562,255	20,217,748	10,778,685	10,358,381

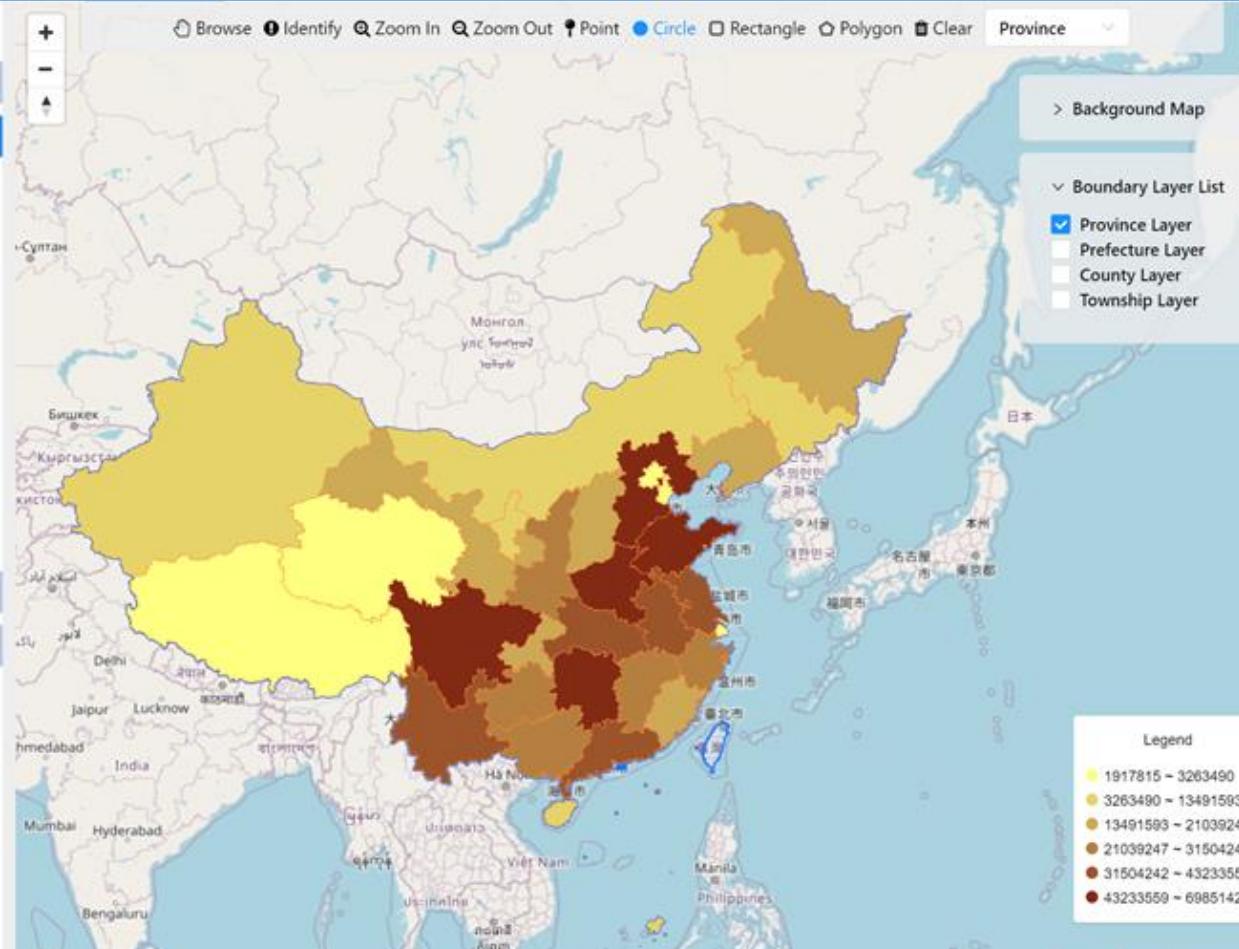
Urban Population & Non-agriculture Population (in 10,000)

■ Urban Population ■ Non-agriculture Population



Spatial Distribution and Structure Change in Rural Population

Rural Population by Province in 2000



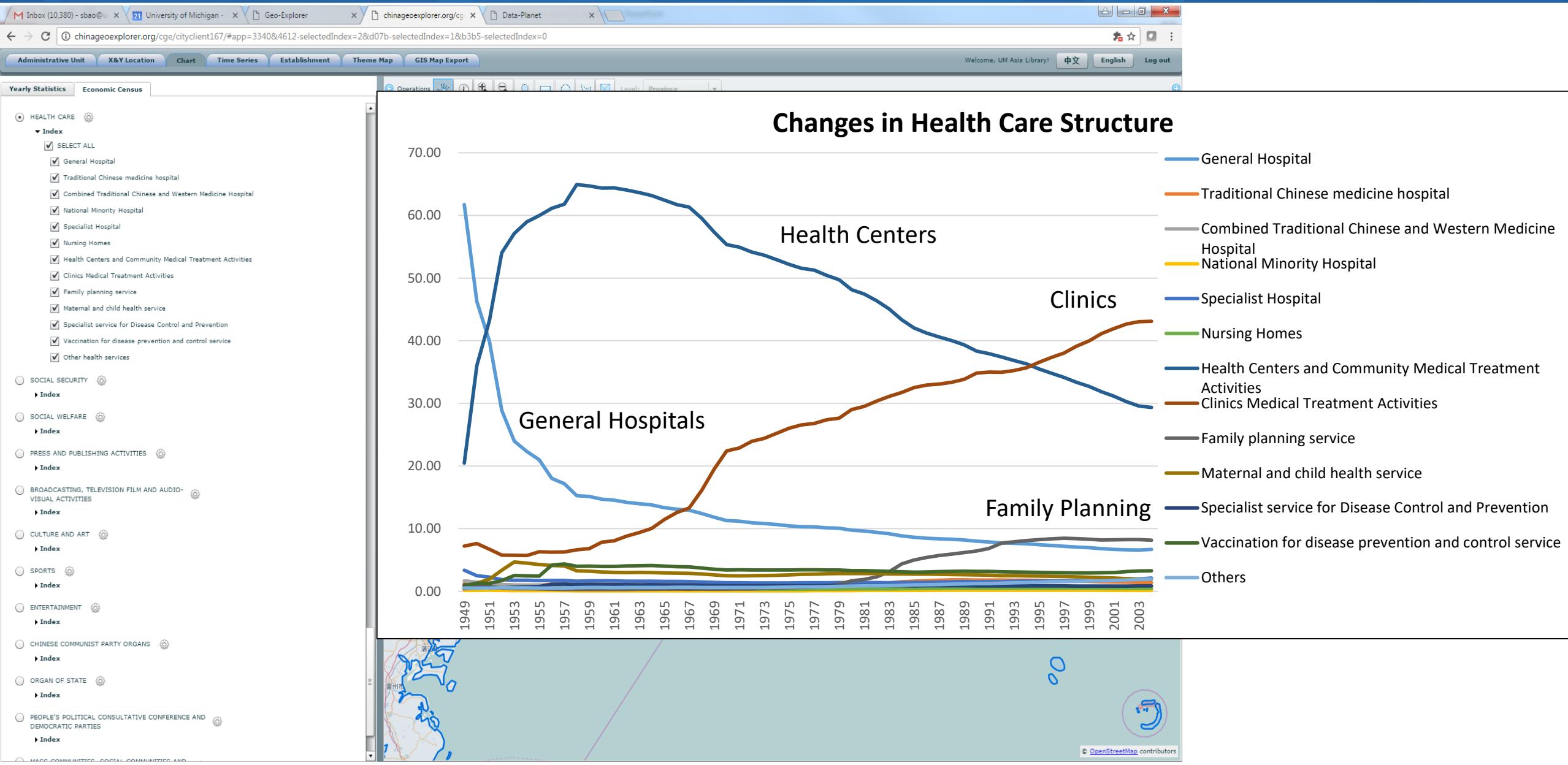
Rural Population by Province in 2000 (%)



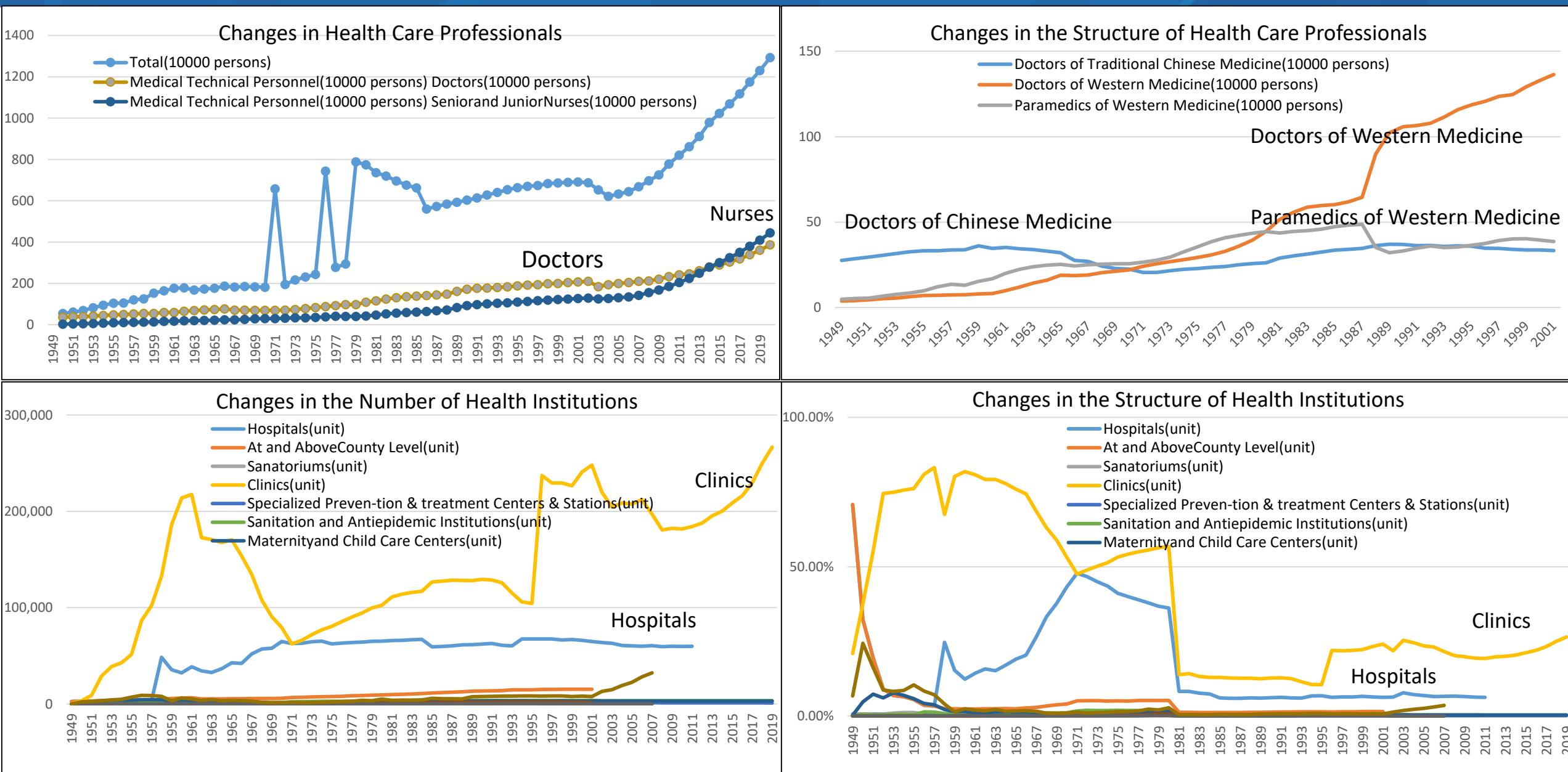
Spatiotemporal Analysis of Health

- Structural Changes in Health Care Industries
- Changes in Health Care Institutions and Professionals
- Spatial Distribution of Health Care Institutions and Professionals and Structural Changes

Structural Changes in Health Care Industries

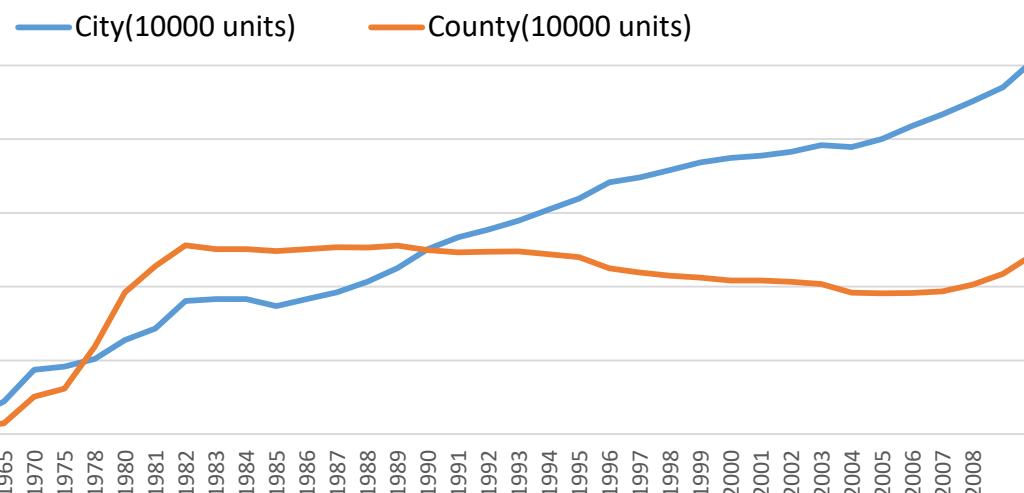


Changes in Health Care Institutions and Professionals

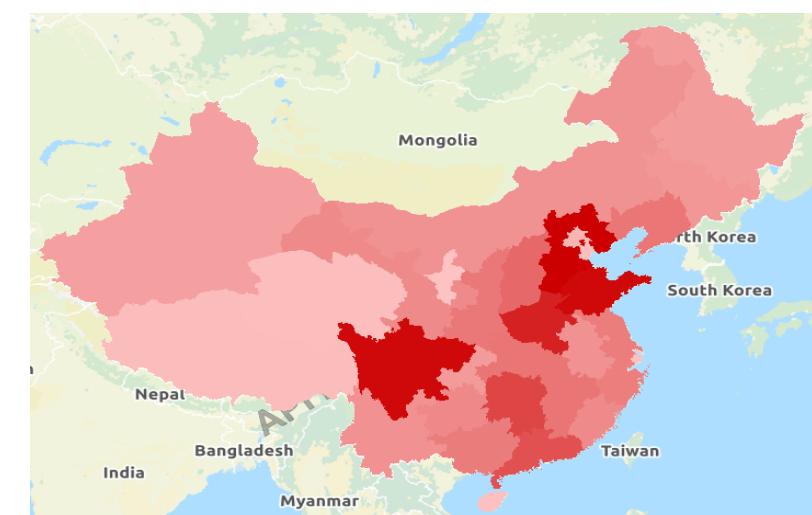
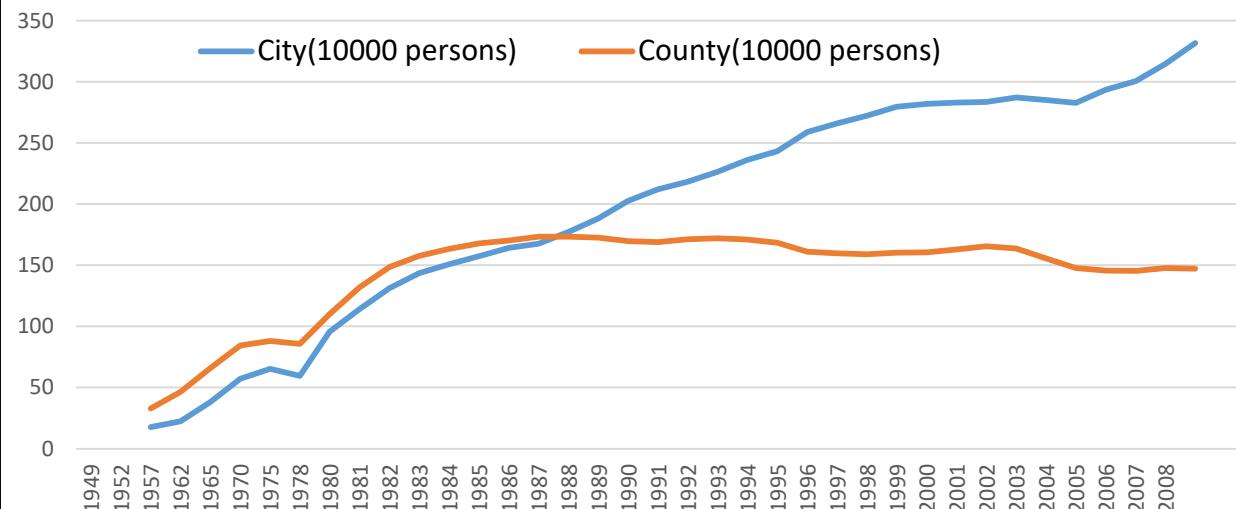


Spatial Distribution of Health Care Institutions and Professionals and Structural Changes

Changes in Hospital Beds



Changes in Doctors by City and County



Doctors Per 10,000 person by Province (2018)

Beds Per 10,000 person by Province (2012)

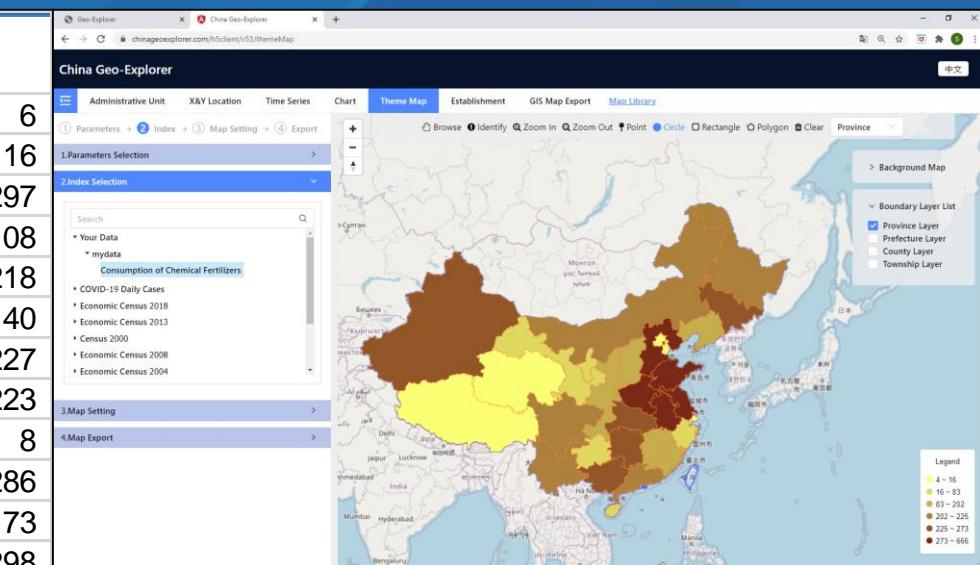
Health Care Institutions by Province (2018)

Spatiotemporal Analysis of Environment

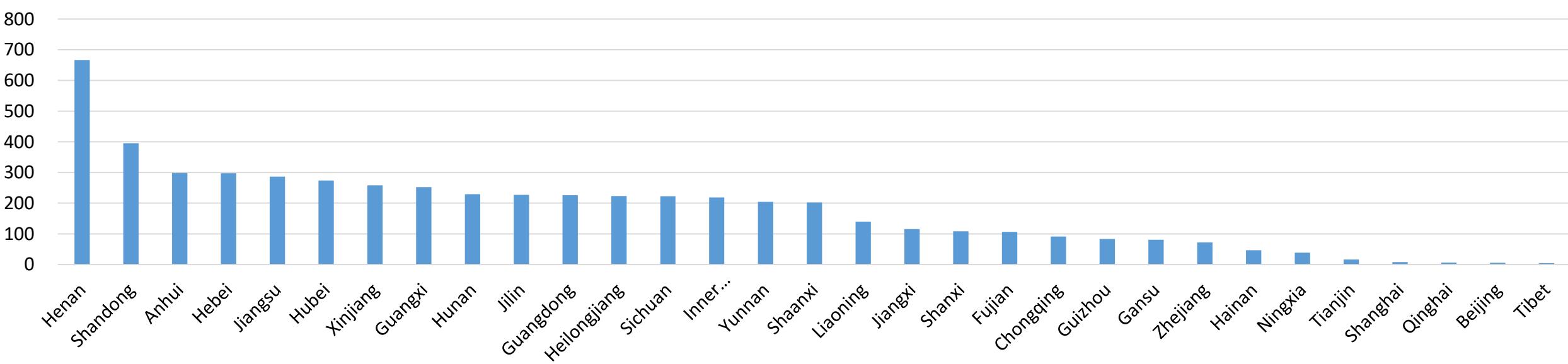
- Spatiotemporal Distribution of Chemical Fertilizer Consumption
- Spatiotemporal Distribution of Textile Industries
- Spatiotemporal Distribution of Power Productions
- Impact Analysis of Wujiang Power Plant on Population and Economy

Spatiotemporal Distribution of Chemical Fertilizer Consumption

Time	District	Consumption of Chemical Fertilizers (10000 tons)	Time	District	Consumption of Chemical Fertilizers (10000 tons)
2018	Beijing	7	2019	Beijing	6
2018	Tianjin	17	2019	Tianjin	16
2018	Hebei	312	2019	Hebei	297
2018	Shanxi	110	2019	Shanxi	108
2018	Inner Mo	223	2019	Inner Mo	218
2018	Liaoning	145	2019	Liaoning	140
2018	Jilin	228	2019	Jilin	227
2018	Heilongjia	246	2019	Heilongjia	223
2018	Shanghai	8	2019	Shanghai	8
2018	Jiangsu	292	2019	Jiangsu	286
2018	Zhejiang	78	2019	Zhejiang	73
2018	Anhui	312	2019	Anhui	298

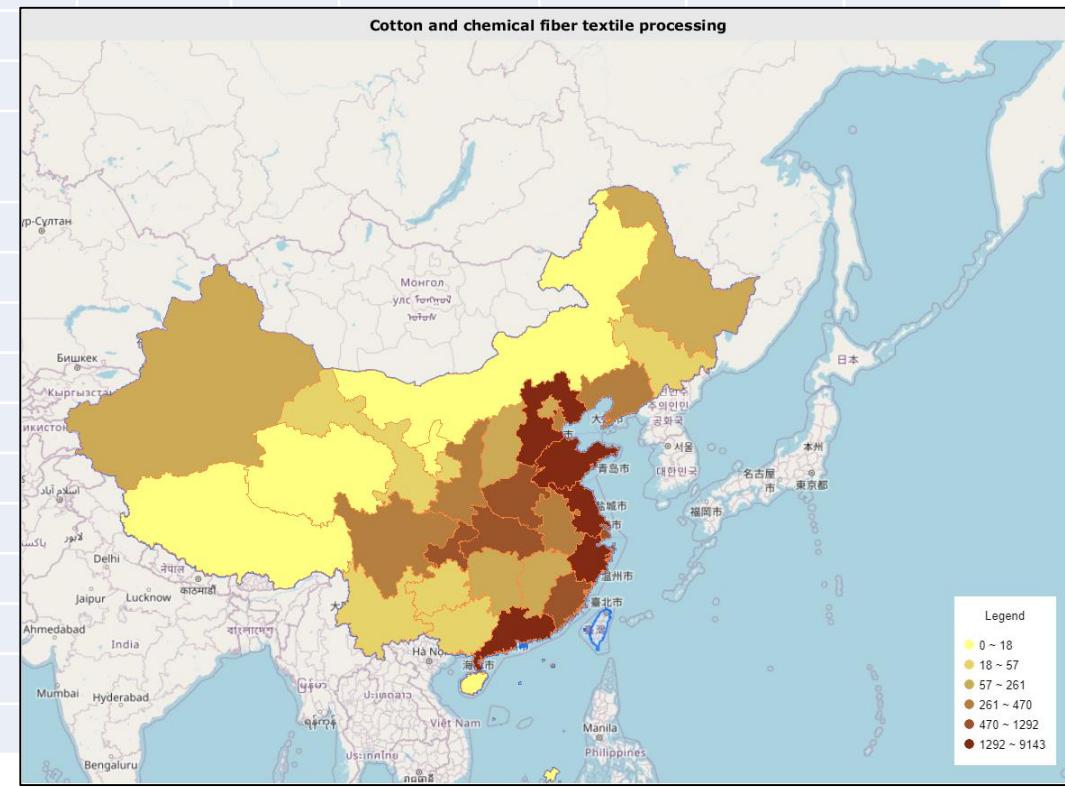


Chemical Fertilizer Consumption by Province (10000 ton)

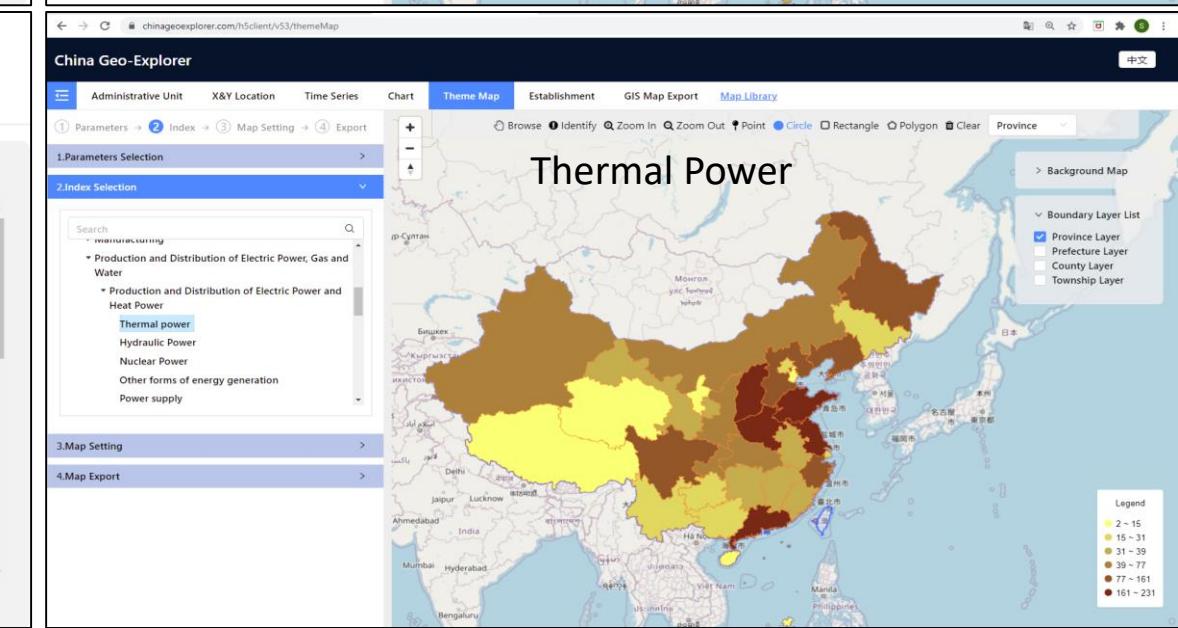
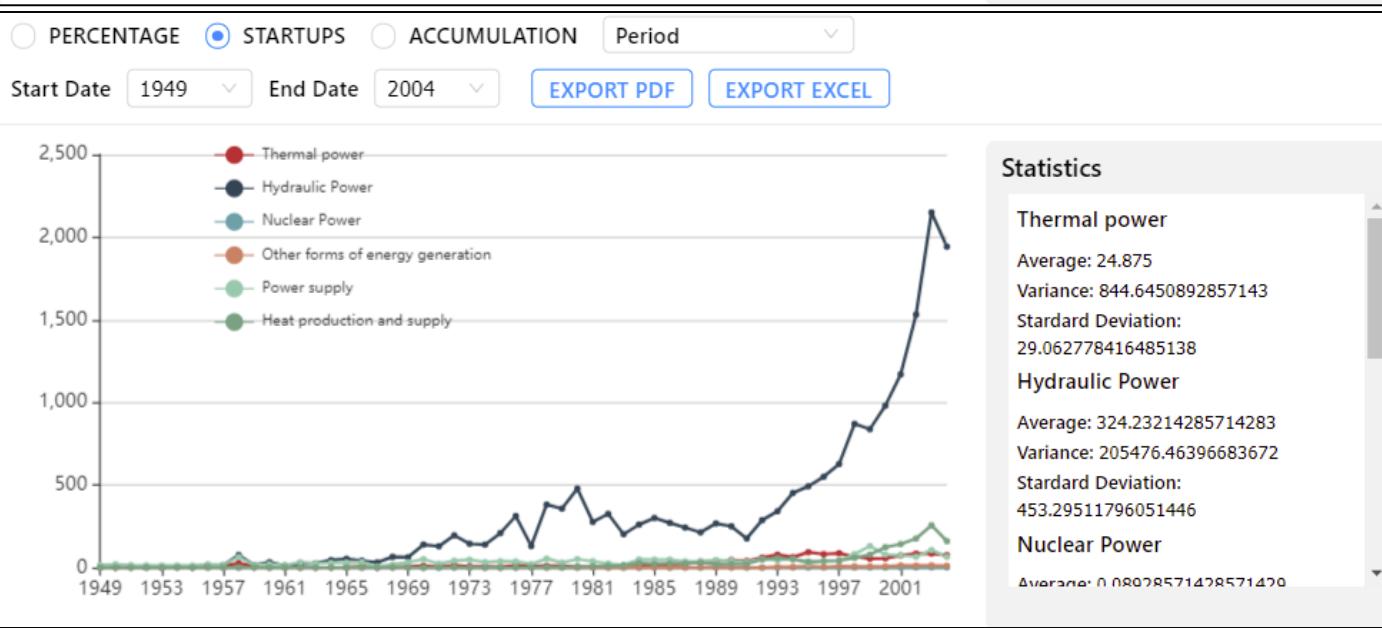
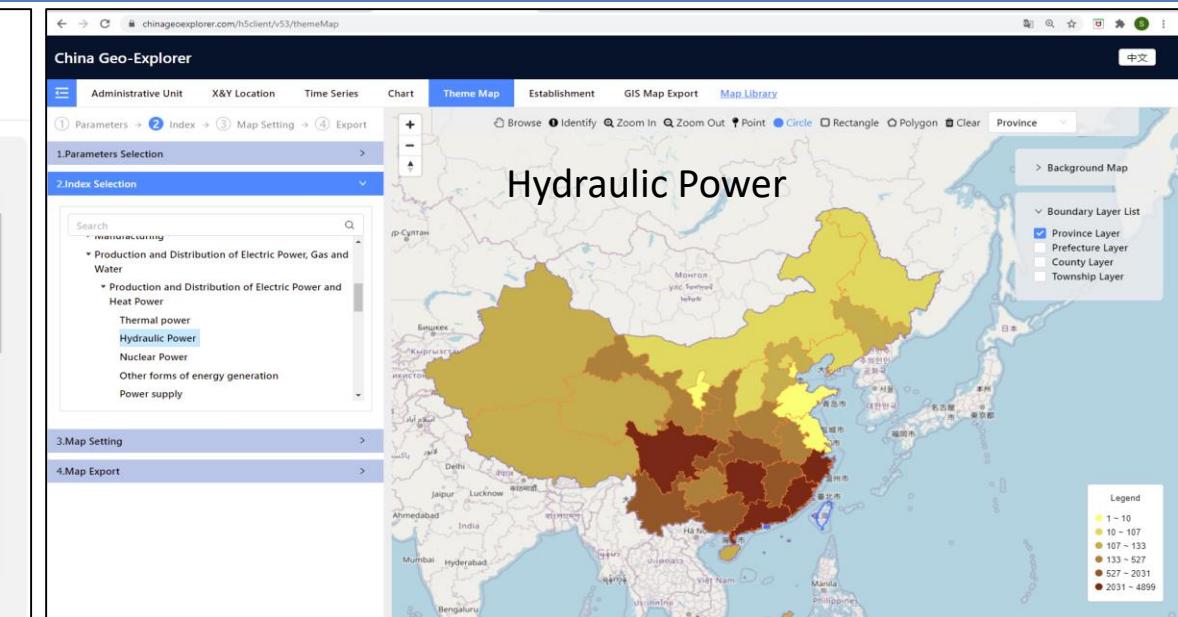
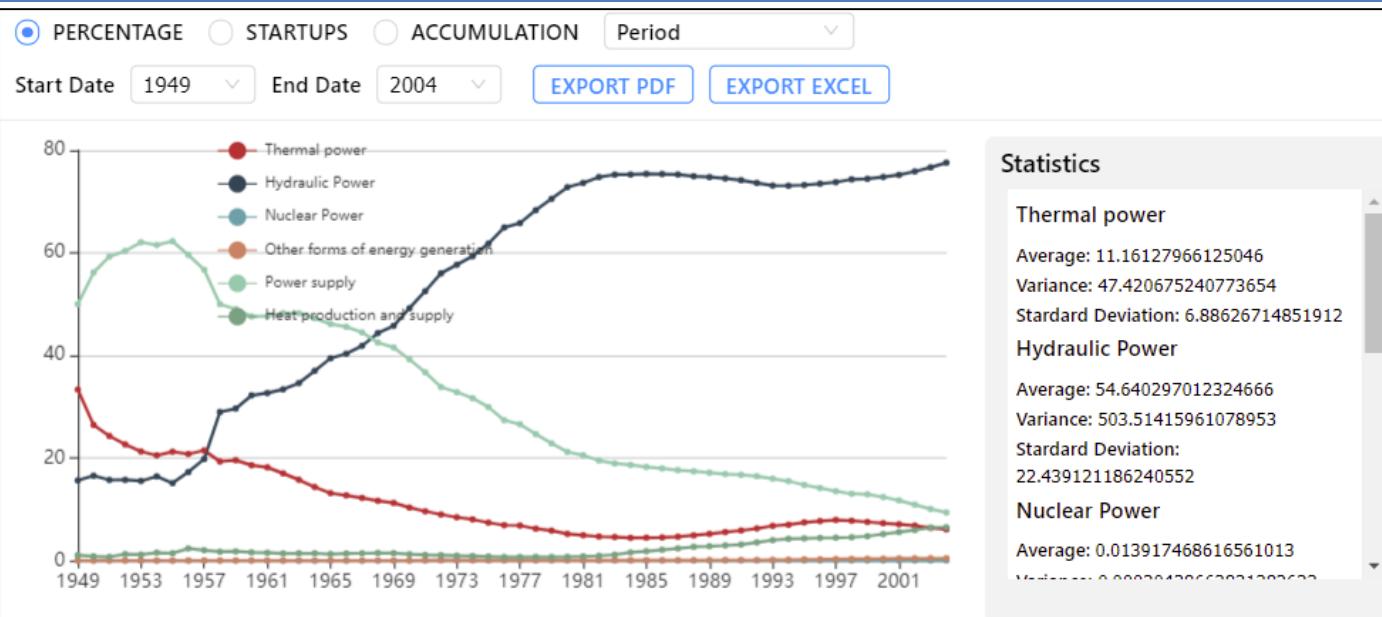


Spatiotemporal Distribution of Textile Industries

Textile Industry/Province	beijing	tianjin	hebei	shanxi	neimenggu	liaoning	jilin	heilongjiang	shanghai	jiangsu	zhejiang
Cotton and chemical fiber textile processing	101	279	1,776	129	18	470	47	78	797	9,143	5,220
Printing and Dyeing of Cotton and Chemical Fibers	34	109	165	22	1	102	4	4	314	1,506	1,258
Wool Tops Processing	3	9	90	3	70	13	4	5	33	276	35
Wool Textile	44	74	602	16	93	34	20	10	132	955	465
Printing, Dyeing and Refining of Wool	2	16	61	0	36	6	3	2	59	185	115
Hemp Spins	1	4	8	6	4	20	16	173	1	206	69
Silk Reeling Processing	0	1	2	7	1	192	1	1	2	242	259
Silk Spinning and silk processing	8	29	13	4							
Printing, Dyeing and Refining of Silk	6	15	11	1							
Cotton and chemical fiber products manufacturing	166	133	1,252	40							
Woolen Products manufacturing	10	22	150	6							
Hemp products manufacturing	6	9	9	0							
Silk products manufacturing	14	5	7	0							
Fishing Rope, Tug and Cable	10	37	46	1							
Woven Belt and Curtain Cloth	16	44	35	5							
Nonwoven manufacturing	33	39	171	3							
Other textile made-ups manufacturing	36	60	39	7							
Products of Cotton and Chemical Fibers	128	218	148	57							
Knitted and Crocheted Products of Wool	211	143	144	11							
Knitted and Crocheted Products of Silk	10	22	16	4							
Other knitwear and woven goods	21	41	21	8							



Spatiotemporal Distribution of Power Productions



Impact Analysis of Wujiang Power Plant on Population and Economy

Map and Data Overview:

The image displays three main interfaces for spatial analysis and reporting:

- Top Left:** A map-based application showing power plant locations across Shanghai. It includes a sidebar with search filters for power plants, a legend for administrative divisions, and a detailed information panel for a selected power plant (Wujiang Power Plant).
- Bottom Left:** The "China Geo-Explorer" platform, featuring a map with a central yellow circle indicating a spatial selection. It includes tabs for "Location Selection", "Spatial Range Selection", "Index Selection", and "Report Export".
- Top Right:** A demographic summary report for the year 2000, generated from the selected location. It shows population statistics by household type, age groups, and employment.
- Bottom Right:** An economic comparison report for the year 2000, also generated from the selected location. It provides data on total businesses by employment size and revenue categories.

Demographic Summary Report (2000) Data:

Category	Count	%	Ratio
Total Households	122,935	100.0 %	Average Size: Family Households
Family Households	111,753	90.9 %	Sex Ratio: Family Households
Collective Households	11,181	9.1 %	Sex Ratio: Collective Households
Population Age 0 to 14	45,237	12.1 %	Dependency Ratio of Children
Population Age 65 or more	34,198	9.2 %	Dependency Ratio of the Aged
Total Population	373,721	100.0 %	Total Dependency Ratio

Economic Comparison Report (2000) Data:

Category	coord1(1mile)	coord1(3mile)	coord1(5mile)			
Count	Percent	Count	Percent	Count	Percent	
Total Businesses	644	1.0	4,890	1.0	8,483	1.0
1-19 Employees	385	0.6	3,315	0.7	5,790	0.7
20-49 Employees	101	0.2	803	0.2	1,348	0.2
50-99 Employees	47	0.1	326	0.1	582	0.1
100-499 Employees	52	0.1	327	0.1	522	0.1
500-999 Employees	6	0.0	31	0.0	55	0.0
1,000 to 4,999 Employees	5	0.0	17	0.0	23	0.0
5,000 to 29,999 Employees	0	0.0	0	0.0	1	0.0
30,000 to 49,999 Employees	0	0.0	0	0.0	0	0.0
50,000 + Employees	48	0.1	71	0.0	162	0.0

Publications



Web Sites and Contact

China Data Online

<http://china-data-online.com>



China Data Lab

<http://chinadatalab.net>

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