

The Impact of Research Collaboration with NCI

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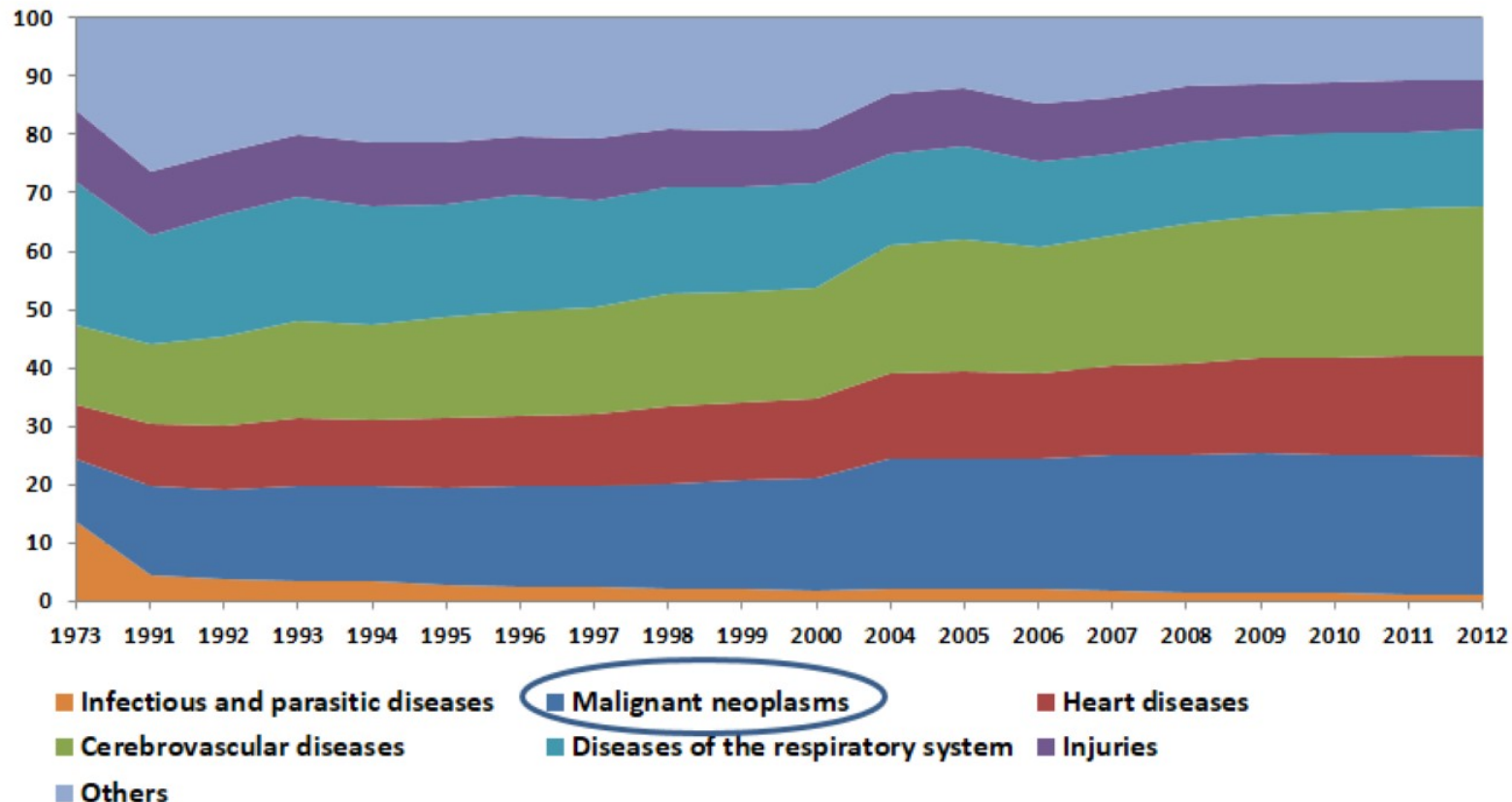


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***Part I. Cancer Mortality, Prevention &
Control in China***

Transition of Causes of Death in China, 1973-2012



Major Causes of Death in China, 2012

Rank	Disease	Mortality (per 100,000)	Percentage of total deaths (%)
1	Cerebrovascular diseases	175.1	25.7
2	Malignant neoplasms	161.7	23.7
3	Heart diseases	116.8	17.1
4	Diseases of the respiratory system	90.5	13.2
5	Injuries	57.5	8.4
6	Diseases of the digestive system	15.7	2.3
7	Endocrine, nutritional and metabolic diseases	13.8	2.0
8	Diseases of the genitourinary system	7.6	1.1
9	Infectious diseases	7.5	1.1
10	Diseases of the nervous system	6.6	1.0

Source: Wang Y, et al. The Annual Report of National Disease Surveillance in 2012.

Cancer-specific Mortality in China, 2012

Cancer ^a	Surveillance mortality by DSPs ^{b,1}				Estimated mortality in GLOBOCAN ^{c,2}
	All areas	Eastern areas	Middle areas	Western areas	All areas
All cancers excl. non-melanoma skin cancer	161.7	174.7	163.9	139.6	162.0
Lung	44.5	50.2	45.1	35.1	43.9
Liver	27.9	27.1	29.3	27.4	28.1
Stomach	22.9	23.6	24.9	19.2	23.9
Esophagus	13.6	13.5	14.0	13.1	14.5
Colorectum	10.1	12.0	9.3	8.3	10.2
Leukaemia	4.1	4.3	4.0	4.0	4.0
Breast	3.7	4.1	3.8	2.8	7.3
Nasopharynx	1.8	1.9	1.5	2.0	1.5
Bladder	1.7	2.0	1.7	1.1	2.0
Cervix uteri	1.7	1.4	2.0	1.6	4.5

^a. Ordered by the top 10 cancer surveyed by Disease Surveillance Points.

^b. Crude rate, per 100,000. Excluding Hong Kong and Macao.

^c. Crude rate, per 100,000. Including Hong Kong and Macao.

Source: 1. Wang Y, et al. The Annual Report of National Disease Surveillance in 2012; 2. GLOBOCAN 2012, IARC.

The Prevention and Control of Cancer in China

- ***Tobacco Control in China***

- ✓ *National Smoke-free Policies and Local Smoke-free Laws*
- ✓ *Notices issued by State Council and Communist Party*
- ✓ *Monitoring and Evaluation*

- ***Cancer Screening Project***

- ✓ *Early detection and treatment Project*
- ✓ *National “Two cancers” (cervical and breast cancer)*

- ***Vaccine and cancer protection (China’s Successful Story of HBV Vaccination)***

Part II. Cancer Risks in Chinese Benzene Workers

China CDC / U.S. NCI

Background

- **Benzene is used worldwide in chemical manufacturing**
- **Low level exposure is common to the general population in gasoline, motor vehicle exhaust, tobacco smoke**
- **Benzene causes acute myeloid leukemia, aplastic anemia, & reproductive effects at high exposure levels, but risks at low exposures for these & other cancers is poorly understood**
- **More information is needed about genetic susceptibility, biomarkers to identify those at high risk, and other aspects of biological mechanisms**

Results: 1986-2001

- Excesses of a spectrum of hematopoietic diseases (all types of myeloid and lymphoid leukemias, non-Hodgkin lymphoma, aplastic anemia, myelodysplastic syndrome)
- Suggested excess risk at low levels (<10 ppm)
- Dose-response relationship for acute myeloid leukemia and non-Hodgkin lymphoma
- Suggested excess risk of lung cancer
- Evidence of genetic susceptibility
- Identified biomarkers of exposure and of biological effects at low exposure levels

Impact of Research

Results from collaborative China CDC – U.S. NCI studies:

- Formed basis of changing occupational threshold limit values in China**
- Used by U.S. Environmental Protection Agency (EPA) to reconsider basis for allowable environmental levels**

Recent and Ongoing

- **Confirmed excesses of a spectrum of hematopoietic diseases (all types of myeloid and lymphoid leukemias, non-Hodgkin lymphoma, aplastic anemia, myelodysplastic syndrome)**
- **Analyzing dose-response for acute myeloid leukemia, non-Hodgkin lymphoma and lung cancer**
- **Evaluating genetic susceptibility and other biomarkers for benzene hematotoxicity**

***Part III. Chinese Children and
Families Cohort Study (CFCS)***

China CDC / U.S.NCI / U.S. CDC

Background

- **Community intervention project (CIP)**
 - 1993-1995, In 21 field sites of 3 provinces, 240,000 pairs of mothers and offspring
 - A unique population with periconception/early first trimester exposure to folic acid supplements and other periconceptual factors
 - Neural tube birth defect prevalence reduced significantly, Push the policy of folic acid supplement in China
- **CFCS**
 - Prospective cohort follow-up based on the unique CIP population
 - Evaluation possible late health effects of periconceptual folic acid on the risk of chronic diseases of mothers, offspring and next generation in an Asian population
 - China's unique population provides an important opportunity to assess a potential preventive public health measure to reduce risk of chronic diseases.

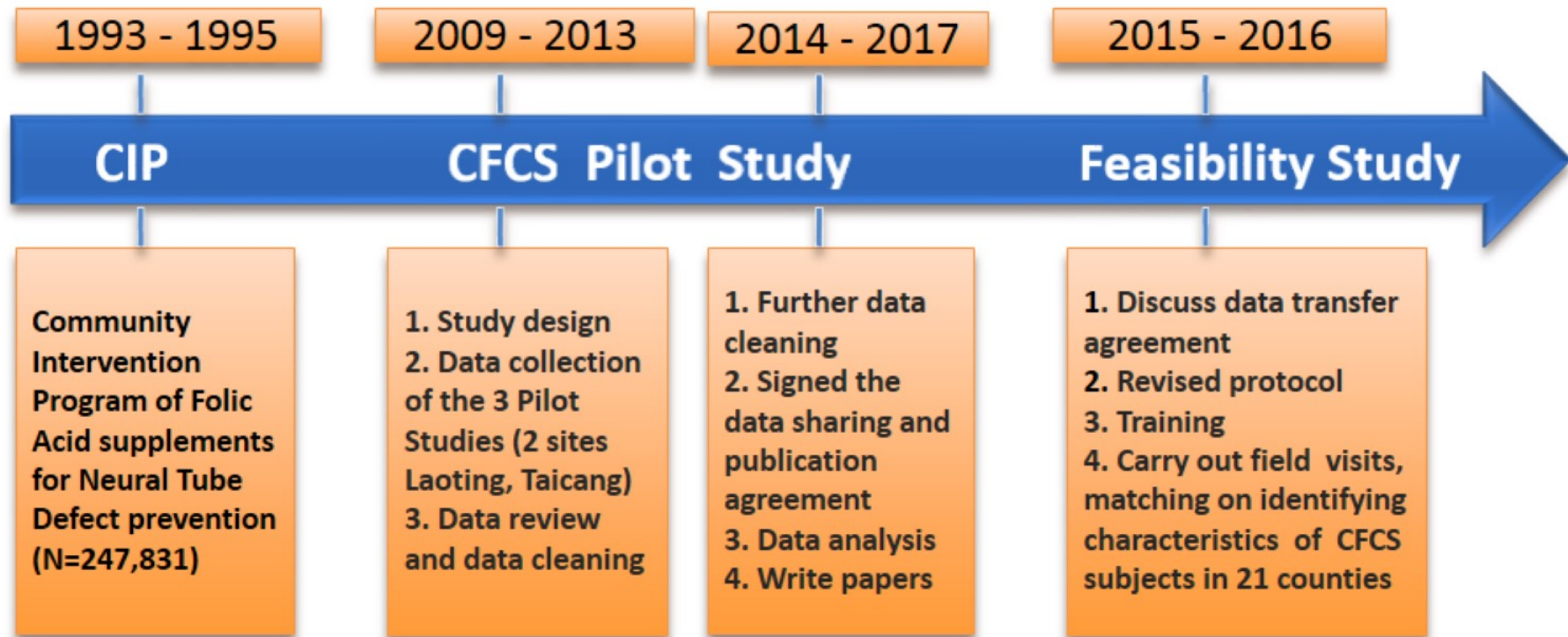
Three Pilot Studies Completed

Study 1: Follow-up of late effects of periconceptional folic acid supplement on CFCS Mothers and their children

Study 2: Assessment of early life and early adulthood risk factors for adult cancers and other chronic diseases (Diet, Nutrition, Physical Activity, Ultraviolet Radiation (UV), and Associated Biomarkers in CFCS Mothers and Offspring)

Study 3: Pediatric cancer cases record linkage cohort & nested case-control study of postulated risk factors for pediatric cancer

Progress on CFCS



Feasibility Study

Specific Aim

- **To determine the feasibility of re-identifying CFCS families on a substantially larger scale than the previous Pilot Study #1**

Study Population

- **CFCS offspring in 5 counties in Hebei Province**
- **CFCS offspring in 16 counties in Jiangsu and Zhejiang Provinces**

Methods

- **Identify databases in the local sites to re-construct cohort**
- **Match with CIP list**

***Part IV. The Impact of NCI
Collaborations on Cancer Research
and Programs in China***

Impact of NCI Collaborations on Cancer Research and Programs in China

- Deepen mutual understanding and trust**
- Strengthen technical exchange and training**
- Provide opportunities for international cooperation and scientific research among young professionals**
- Promote research on the association between periconceptual, prenatal, and childhood exposures and risks of chronic diseases such as cancer**

Part IV. The Areas for Future Collaboration

Areas for Future Collaboration

- Further expand research on the association of early life exposures and chronic diseases such as cancer**
- Enhance the collaborative CFCS data analysis and publication, to provide the scientific basis for prevention of cancer and other chronic diseases**
- Strengthen the cooperation, communication, and training on data collection and management, and analysis of cancer descriptive and analytic studies between China and US**

Areas for Future Collaboration

- Continue to expand cooperation in the field of study of cancer risk factors, for example, the relationship between environment and cancer**
- Enhance research and collaboration on cancer prevention, intervention, and vaccine development and application**

Thank You!