

Appendix I

Proposed Data Items

The template, below, was used in exploratory discussion with several TPAs; it is based on review of the proposal and claims forms provided by IRDA and used by Indian health insurers and TPAs. TPA staffs were asked to review, item by item, the data elements and to indicate whether the relevant data were available in their automated claims systems. They were also asked whether and to what extent these items were thought to be available from the automated systems of the other major TPAs.

Following each data item, the results of these discussions are summarized, in **bolded, underlined [italicized brackets]**. **[Available]** indicates that staff of interviewed TPAs knew the element to be available in automated format for their own client base, and believed it similarly available from other TPAs.

Exposure Items¹

For each TPA, the number of people (“lives”) they serve, broken down into the following categories and subcategories:

- A. Number covered by an insurance contract **[Available]**.
- B. Under each group, the data (many of which are taken initially in the Proposal Form) broken down by:
 - a. Geographic area **[Available]**²
 - b. Industry of employer **[not available from TPA, only from insurer]**
 - c. Profession/Occupation/Trade or Business of Insured **[not available from TPA, only from insurer]**
 - d. Whether Insured also covered by other insurance **[Virtually a null set in India at this time but in the handful of cases, Available]**
 - e. Whether there are pre-existing conditions **[Available]**³

¹ “Exposure Items” are from the Proposal form. As indicated, some of these elements are available only from the insurer, most often in hard copy; other elements are also maintained by the cognizant TPA, to whom they are necessary to conduct their administrator tasks. It should be noted that some items available only from the insurer are collected only with the initial application. Thus, for example, while the profession or trade of an individual applicant may be collected in the original proposal, the item, even if it changes, is unlikely to be updated as part of the annual policy renewal process.

² By geographic region of the policyholder – either group entity or holder of individual policy.

³ Preexisting conditions were the subject of extended discussion with TPA staffs. The conclusion of these discussions was that in those remarkably rare cases where an applicant had actually acknowledged such a preexisting condition in his application, the insurer would probably have informed the TPA and the TPA would have recorded it. However, the perception was that hardly ever would such an admission be included in the proposal, in part because it’s “not the Indian way,” and, in any event, the agent would probably discourage any such entry. Moreover, the TPA most often exercises the

- f. Pay (tax) or Size/Rs. limit of policy [Note: Policy size (limits) is, broadly, a proxy for pay or income.] [Policy Rs. limits Available]
- C. For each data cell, the number of people covered, as well as the average size of monthly premium [Available]

Claims Items

For each TPA, summary claim information related to each exposure cell, further broken down by the following:

- Nature of Disease/Illness, using standard disease code [Currently problematic]⁴
- Whether the disease was treated in or out of hospital [Available]⁵
- For each data cell, the number of people submitting claims, and the number of people receiving payments [Available]
- For those receiving payments, the average duration of coverage [Available], and the amount of claims [Available] with:
 - The average duration broken down by:
 - Average period of treatment [Available]
 - Average period excluded for:⁶
 - Co-ordination of benefits [Not applicable]⁷
 - Pre-existing conditions [Available but not generally applicable]⁸
 - Elimination (or waiting) period [Not applicable]⁹
 - Maximum period of treatment allowed [Not applicable]¹⁰

preexisting condition exclusion on medical grounds either on a pre-admission approval basis for cashless claims hospitals, or on a post review basis for claims involving other facilities. So, while the information is considered “available,” the item is relatively meaningless,

⁴ At this time, few TPAs have implemented coding and apparently none has yet automated disease coding, but a number are in process of thinking through how to do this, at least for their cashless hospitals. Sources suggest, however, that absent some external requirement, there will be no standard coding across TPAs in the near term. Nonetheless, an important by-product of efforts to expedite and facilitate the sharing of data is enhancing common data definitions and specifications. None is potentially more important than assuring the capacity to crosswalk among alternative disease codes which various insurers and TPAs may select.

⁵ There are very few health insurance plans that provide primary or outpatient coverage. TPAs for plans that do provide such benefits are able to provide this information on utilization. All TPAs are able to discriminate between “hospital” and “domiciliary hospitalization” payments.

⁶ These either don’t apply in India or don’t currently apply in practice. There is neither medical underwriting, nor are there any medical underwriting standards.

⁷ In theory, available but in reality a null set – holders of multiple benefits plans are virtually non-existent.

⁸ Not applicable to any current insurance coverage in India: preexisting condition exclusions, except for those few waived from day one for an additional premium, are generally life-long and not usually subject to an exclusion period. See also fn. 4, above.

⁹ Not a component in any current Indian health insurance product.

- Average period of treatment paid by the medical plan
- The average amount of claims, broken down by:
 - The type of charges: [Available]¹¹
 - Hospital room and board
 - Consultants'/Surgeons'/Anesthetists' fees
 - Diagnostics Tests
 - Medicines purchased from chemists/pharmacies
 - Other expenses not included above
 - For each type of expense, data about
 - Average total amount claimed [Available]
 - Average offsets due to:
 - Co-ordination of benefits [Not applicable]¹²
 - Pre-existing conditions [Not applicable]¹³
 - Elimination period [Not applicable]¹⁴
 - Copay [Available]
 - Deductible—specify [Available]
 - ❖ Percent, or
 - ❖ Amount
 - Maximum benefit limit [Available]
 - Average amount paid [Available]

¹⁰ Not applicable to any current Indian health coverage, all policies are Rs.-, not day- or treatment-length capped.

¹¹ While different TPAs will have different categories, data from all could be reliably collapsed into common several categories.

¹² See fn. 8, above.

¹³ See fn. 9, above.

¹⁴ See fn. 10, above.

**6TH GLOBAL CONFERENCE OF ACTUARIES
18-19 FEBRUARY, 2004**

**In Search of Data for Health Insurance in India
by Michael Sze, PhD, FSA, FCIA, CFA
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(Subject code 04 – Subject Group : Health, Long Term Care, Mortality & Morbidity)

The purpose of this paper is to accompany a presentation on the same topic at the Sixth Global Conference of Actuaries at Delhi, India on February 18-19, 2004.

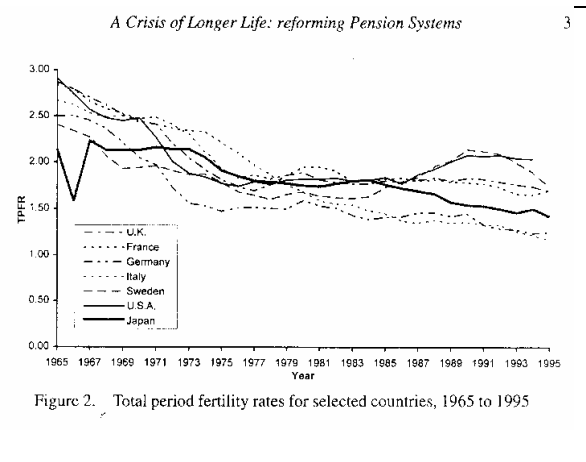
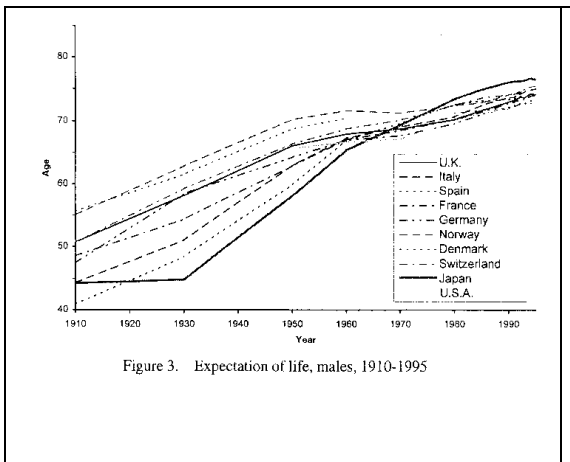
Health insurance is still in its infancy in India, but it is growing fast. The frustration of many professionals in this area is the severe lack of statistical data for cost analysis and policy setting. This paper provides an account of past efforts of data collection and describes some recent initiatives in this area.

The paper is divided into the following six sections:

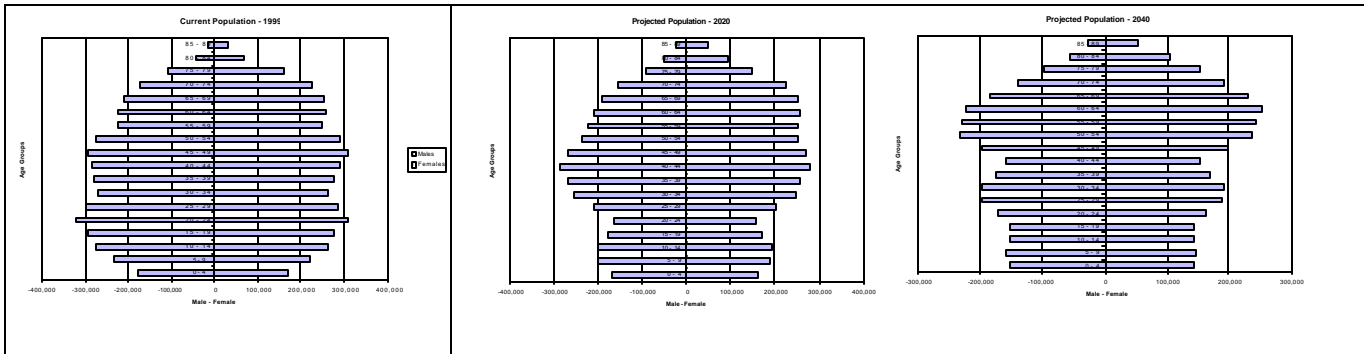
- Background – impact of worldwide aging crisis on healthcare cost
- Brief discussion of Indian demographic statistics
- Overview of Indian health expenditure and healthcare providers
- Brief overview of Indian insurance companies
- Healthcare data for insurance companies
- Current projects on data collection

Worldwide Aging Crisis

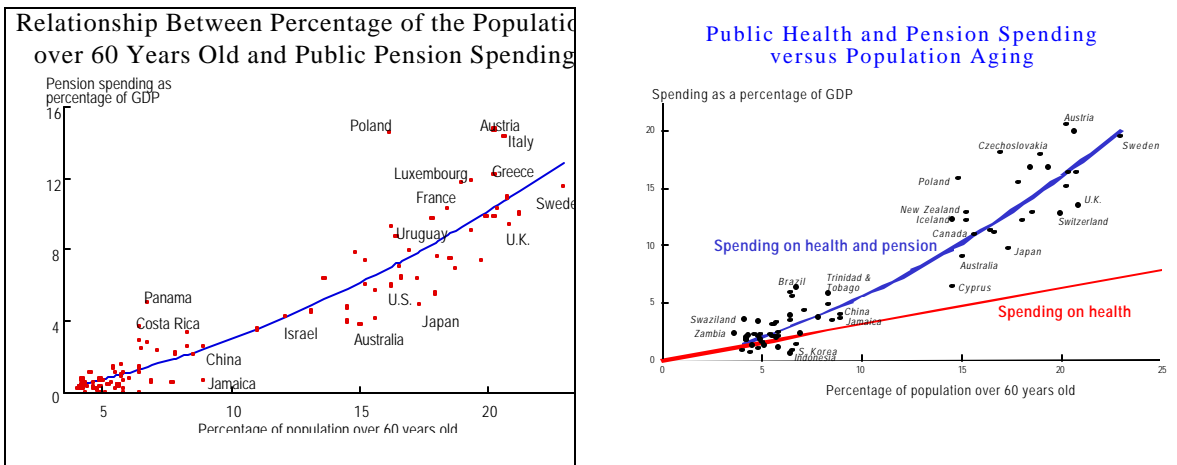
There was substantial mortality improvement in all countries in the last century. Consequently, as shown in the following graph, the life expectancy at birth has increased to over 70 years in many countries.



This is coupled with a substantial decline in the total fertility rates in many countries. In countries such as Japan, Italy, and Germany, the current total fertility rates are substantially below the population sustainable level of 2.1. As a result the working population in these countries will shrink while the retired population will increase. Take a look at the population graphs of the United States for instance - the bulging portion of the graphs continues to move upwards causing an ever increasing dependency ratio (defined as the size of the population over age 60 divided by the population between ages 15 and 60).

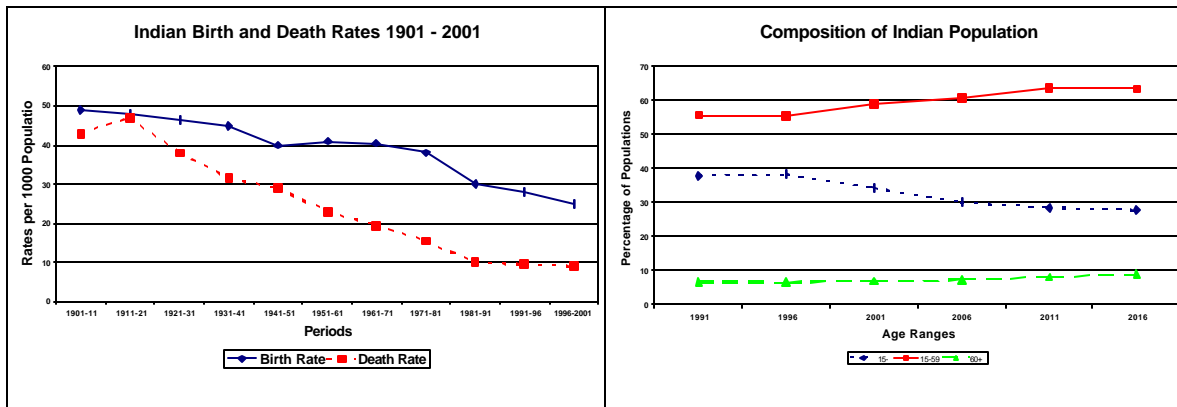


The aging of the population together with the resulting increase in dependency ratios has a dramatic impact on pension and healthcare costs, as demonstrated in the following graphs taken from a World Bank study by Estelle James. The countries with higher dependency ratios generally have higher pension and healthcare costs.



How does this discussion apply to India? We start with a brief discussion of the demography of the Indian population.

Overview of Indian Demography



As shown in the graphs on the last page, there are substantial decreases in both the birth rate and the death rate in India in the last century. The death rates are decreasing more sharply than the birth rates. As a consequence, the percentage population below age 15 has a continuous decline. Because the total fertility rate in India is still around 3.0, there are still increases in both the percentages of the working and the retired population. However, the healthcare challenges for India are three-fold:

- For the age group below age 15, there needs to be significant improvement in the quality and coverage of healthcare facility and nutrition to reduce childhood mortality rate.
- The population in the age group between 15 and 59 is basically healthy. However, there tend to be increases in lifestyle diseases, together with more accidents and traumas. More health education is needed.
- The retired population of age 60 and over is living longer. However, many in the age group, especially women, are in poor health. Further improvement in healthcare facilities and living habits will enhance the quality of life.

We end this section with some statistics from the World Health Organization (WHO) and the United Nation International Children Education Fund (UNICEF):

- Total Indian population in 2001: 1,025 million
- GDP per capita: US\$1,461 (Approximately INR 67,000)
- Life expectancy at birth: 60.1 for male / 61.7 for female
- Healthy life expectancy at birth: 51.5 for male / 51.3 for female
- Child mortality rate (per thousand): 89 for male / 98 for female

Health Expenditure of India

According to WHO in 2001 the total health expenditure of India as a percentage of the GDP was 4.9% of which the government paid only 0.9%. The rest was out-of-pocket expenses for individuals. This compares with 14.4% in the United States, half of which is government paid, and 8.7% in Canada, 70% of which is government paid.

By World Bank data in 2003 total health expenditure of India was 6.0%, of which 1.73% was government paid, and 4.5% from out-of-pocket expenses of private individuals. Of government expenditure, three-quarters were from state and local governments, and one-quarter was from central government. Of the total expense, one-sixth was for pharmaceuticals, and the rest for health care.

The following tables show the coverage in millions of public and private health care arrangements.

The data were estimated from assessments by BearingPoint on Health Insurance, and the websites of the Central Government Health Scheme (CGHS) and the Employee State Insurance Scheme (ESIS). In total, less than 10% of the population has public or private health care coverage. Much broader coverage is needed.

Health Insurance Companies				
Life Companies		General Companies		
	Market Share %		Premiums (Millions)	No. of Policies
State Company		State Companies		
LIC	92.00%	National	2,026.4	522,910
Private Companies		New India	3,900.0	955,767
ICICI - Prudential	2.96%	Oriental	1,870.0	400,190
Birla - Sun Life	1.21%	United India	<u>1,831.7</u>	<u>178,050</u>
HDFC - Standard	1.08%	Subtotal	9,628.1	2,056,917
		Private Companies		
		Bajaj Allianz	106.3	16,883
		Cholamandalam	12.2	1,445
		ICICI - Lombard	134.2	799
		IFFCO - Tokyo	95.4	12,578
		Reliance	51.8	934
		Royal Sundaram	95.3	23,271
		Tata AIG	<u>328.2</u>	<u>91,700</u>
		Subtotal	823.4	147,610

Data source: IRDA quarterly report.

By far the greater share of the health insurance market is with the State Companies. For general insurance companies, the market share of the State Companies is 92.1% by premium, and 93.3% by number of policies. This indicates that the average size of the policy premium is larger for the Private Companies.

There was a large increase in health insurance in India from 2002 to 2003. The percentage premium increase was 195% for Private Companies, and 60% for Public Companies. The percentage increase in the number of policies sold was 78% for Private

Companies and 60% for Public Companies. Again, this shows that the average size of policy premium is bigger for Private Companies.

Such development also contribute to the economy of India by

- providing financial security against health care risk
- enhancing the physical health of the population
- providing capital for economic growth

Health Care Data Base

Because of the rapid development of healthcare services, there is an urgent demand for accurate medical data by different stakeholders of healthcare system.

- By the government, in order to better assess healthcare priorities of the country
- By healthcare providers, to better allocate medical facilities and services to areas of more urgent need
- By insurance companies, for more appropriate health care plan designs, and more accurate determination of insurance premium. Indeed, without proper data to determine appropriate premiums, on the one hand, many insurance companies have complained of insurance losses, and on the other hand, other companies have expressed concerns that premiums may be too high. In addition, many consumers have complained of inadequate coverage in some areas and excessive coverage in other areas.

The concern for the lack of reliable healthcare data has been expressed by various groups of healthcare professionals. In the National Health Plan, 2002, the Ministry of Health expressed concern that in the current scenario the absence of a systematic and scientific health statistics database had resulted in major deficiency in proper pricing of healthcare insurance.

A survey was conducted in 2003 by the Federation of Indian Chambers of Commerce and Industry, in which 147 organizations, including life and non-life insurance companies, insurance consultants, and intermediaries, participated. On the questions as to factors hindering the development of health insurance, 79% cited lack of adequate data as a major concern. This was second only to inadequate supervision of healthcare service providers.

The Health Insurance Work Group was formed at the meeting convened by the IRDA on September 2, 2003. The Work Group noted that the lack of standards for data systems has been the cause for failing to:

- price policies fairly
- manage medical institutions well
- allocate public resources for healthcare wisely
- regulate insurance companies effectively
- monitor quality of care to safeguard consumers

Following the initial meeting of the Work Group, BearingPoint conducted exploratory meetings with TPAs and insurers to test the feasibility for data collection through the use

of information readily available on policy application form and claim forms. Also explored was the practicality of data transfer.

Initial results of the TPA visits are encouraging. All the TPAs are very co-operative. There is enough uniformity in the available data to suggest the possibility of meaningful aggregation of the data collected from different TPAs. Data collection may not be too difficult, since most TPAs are highly automated. Hence, data may be collected electronically. It should be noted, however, that this data shall mainly be concentrated on private hospitals focusing to high end clientele.

A Joint Working Group was formed by the Ministry of Information Technology to develop a Framework for the Information Technology Infrastructure for Health in India. The Joint Working Group include representatives of all major stakeholders. The Framework has been completed and adopted by the Working Group and presented to the Health Insurance Work Group in their January 2004 meeting. The Framework report, "Technology Infrastructure for Health in India", detailed the format of the information required for a health data base. It also adopted a internationally accepted coding system for diseases. Information concerning the Framework is available on website www.mit.gov.in/telemedicine/home.asp.

As a follow-up on the effort of BearingPoint, a Health Insurance Data Subgroup is formed in January 2004 with the mandate to establish the Health Care Data Base. Members of the Data Subgroup include representatives from

- Insurers
- TPAs
- Insurance consultants
- IRDA

The Data Subgroup is to present a quarterly report to the Health Insurance Work Group.

However, there are still many issues to be resolved before actual data collection can begin. These include the following:

- The availability of data in a unified format, and with sufficient detailed breakdowns
- A test of the degree of compatibility of the data sets from different TPAs
- Issues concerning the retrieval and storage of the data
- Issues on the update mechanism of the data
- Issues on control of use of the data

A list of available/desirable data items is provided in the Appendix.

It is anticipated that the Data Subgroup will initiate the following activities:

1. Sharing of currently available data. The Subgroup will start with a pilot project to collect data from a few selected TPAs in order to iron out the procedure to ensure

confidentiality and integrity of the data, and to determine the compatibility of data from different sources. It will also attempt the initial merger of data for statistical analysis and use. Analysis will be made to assess the cost of storing and use of the data.

2. Enhancing and standardizing data coding. The Subgroup will promote the use of internationally accepted standardized diagnostic coding of medical claims. It will work out a mechanism to ensure linkage of exposure to claims, capturing claim frequency, severity, etc. in the process.
3. Devising facilities to handle alternative forms of insurance. This may include the structural coding procedure for other forms of insurance and healthcare delivery systems.

In performing the above functions, the Subgroup may need to develop

- alternative coverage forms
- better understanding of healthcare provisions
- quality control mechanisms
- insurer / provider negotiations.

As is evident from the above discussion, there is substantial need for actuarial expertise

- in designing the system,
 - because the system must capture all items needed for actuarial analysis and insurance pricing
 - because the system must allow for easy retrieval and frequent updates
 - because there must be dichotomy of data by age, sex, industry, occupation, policy size
 - because the system must be able to track different coverages by family status, including single, family, and family with children
- in testing the system,
 - retrieving the data for actuarial analysis
 - retrieving the data for the construction of mortality and morbidity tables

In conclusion, we anticipate much development in the healthcare systems in India. The construction of the health data base is very important both for the industry and for the insurance companies the actuaries are serving. My recommendations to actuaries with substantial experience on data collection and mortality/ morbidity constructions are to participate in the development phase of the data base, and to provide help in the construction and testing of the data base. My recommendation to other actuaries is to follow the development closely so as to be prepared for possible new guidelines on actuarial assumptions derived from the use of the data base.

About the Author

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Dr. Sze is a leading expert on Pension, Insurance, and Social Security modeling and funding. He is a retired partner of Hewitt Associates, where he was an actuarial manager and lead consultant on pension projection. He is currently the President and Owner of Sze Associates, Ltd., a financial and benefits consulting company.

Dr. Sze has over twenty-five years of experience as a pension consultant. He has guided private companies through critical events such as buy/sell, merger/spin-off, termination, union negotiation. As a leading member of his profession, he has helped various government bodies in formulating pension and insurance regulations and administrative rules.

Dr. Sze is a well-respected teacher of insurance and pension, renowned for his exceptional ability to communicate complicated concepts in simple terms. He is a frequent speaker at professional actuarial and pension conferences. He created the actuarial profession in Kazakhstan. He has taught the principles, practice, and regulations of pension and insurance to regulators, actuaries, and other professionals in Canada, Egypt, Kazakhstan, Bulgaria, and Bhutan, where he reviewed some actuarial reports by Indian actuaries.

As a former partner and actuarial manager of Hewitt Associates, Dr. Sze was closely involved in the benefit design, costing, and employee preference issues of healthcare benefit plans. He was the author of the flexible compensation section of Canada's *Carswell's Benefit Guide, with quarterly updates since 1999*. The flexible compensation section of the *Guide* deals with the working and financing of all healthcare benefits. As a former actuarial professor at the University of Michigan and consulting actuary to Kazakhstan, and Egypt, Dr. Sze taught P&C and Health Insurance, as well as advised the regulators in their review of P&C and Health Insurance Companies.

Professional Experience

U.S. Agency for International Development (USAID), Egypt, Modernizing Egyptian Insurance Supervision, Actuarial Expert, 2002-Present. Dr. Sze has served as an actuarial expert and consultant, providing actuarial training to Egyptian actuaries and other regulators in the Egyptian Insurance Supervisory Authority (EISA), and helping EISA formulate the examination procedure for private retirement systems and insurance companies. He is instrumental in formulating the regulatory rules for the latest reform of private retirement plans in Egypt.

U.S. Agency for International Development (USAID), Kazakhstan, Pension Reform Project, Actuarial Expert, 1999-Present. Dr. Sze has served as an actuarial expert and consultant, providing actuarial training to senior executives of pension funds and insurance companies in Kazakhstan. He has developed and is teaching an actuarial science program on insurance and pension in the country. He is a Member of the Qualification Commission for Actuaries in Kazakhstan. Over thirty of his students have been certified as the only Licensed Actuaries in the country. He is also the actuarial expert for the pension protection project with the Ministry of Labour of Kazakhstan.

Consulting Assignments in Canada, 1975-present. Beside being a pension consultant on numerous projects, Dr. Sze has taught Pension to many government bodies including Trustees of the City of Toronto Pension Plans, Alberta and New Brunswick governments, Canada Post Office, Canadian Wheat Board. Dr. Sze has provided a major training program for Pension Officers of the Financial Services Commission of Ontario on Pension Regulations.

Asian Development Bank, Bhutan, Pension Reform Program, Actuarial Expert, 2000-2002. Dr. Sze served as an actuarial expert for a Pension Reform program in Bhutan. He advised the government on the design and administration of a new social security system. In that capacity, he has reviewed actuarial reports by Indian actuaries.

North American Actuarial Journal, Acting Associate Editor, 1999 – Present.

Journal of Actuarial Practice, Associate Editor, 1994 – Present.

U.S. Agency for International Development (USAID), Bulgaria, Social Security Training Program, Faculty Member, 1997 and 1999. Dr. Sze taught Bulgarian social security experts on the funding of social security.

Social Security Administration, U.S.A, Member of Technical Panel, 1994-1996, 1999. Dr. Sze served as a member of the Technical Panel on Assumptions and Method of the Advisory Board to the Social Security Administration. The Panel makes recommendations on the actuarial assumptions to be used in the SSA.

Social Security of the NAFTA Countries, Research Chair, 1997 – 1998. Dr. Sze was the Chair of a research study of the Society of Actuaries on the Impact of Mortality Improvement on Social Security of the NAFTA Countries.

Pension Benefits Guaranty Corporation, U.S.A., Member of the Technical Review Panel, 1996. Dr. Sze was a member of the Technical Review Panel of the Pension Insurance Modeling System of the Pension Benefits Guaranty Corporation, U.S.A.

Education

Ph.D., Mathematics, 1975, Ohio State University

M.S., Mathematics, 1969, California State University

B.Sc., Mathematics and Physics, 1964, University of Hong Kong

Employment History

President and Owner, Sze Associates Ltd., Toronto, Ontario Canada, 1996 - Present
Adjunct Professor of Mathematics, University of Michigan, Michigan, USA 1998 – 1999
Partner, Pension and Investment Projection Specialist, Hewitt Associates LLC, USA and Canada, 1975 – 1996
Teaching Assistant, Ohio State University, Ohio, USA 1969 – 1975
Teaching Associate, California State University, California, USA 1968 – 1969
Mathematics and Physics Teacher, St. Paul’s Secondary School, Hong Kong, 1964-1968

Languages Spoken

English

Chinese (Mandarin, Cantonese, and Shanghai)

Selected Publications

- Co-author of *Carswell’s Benefits Guide for Canada*
- Co-author of “Overview of the study: impact of mortality improvement on social security in the NAFTA countries,” *North American Actuarial Journal*
- Co-author of “Impact of aging population with declining mortality on social security in the NAFTA Countries,” *North American Actuarial Journal*
- “Stochastic simulation of the financial status of the social security trust fund in the next 75 years,” *Report of the 1994-1996 Advisory Council on Social Security*
- “The process of pension forecasting,” *Journal of Actuarial Practice*

Professional Affiliations

- Fellow of the Society of Actuaries (FSA)
- Chartered Financial Analyst Charterholder (CFA)
- **Member of Social Security Committee of the Society of Actuaries (Chairman, 1994 – 1996)**
- Member of the Board of Governors of the Society of Actuaries, 1994 – 1997
- Fellow of Canadian Institute of Actuaries (FCIA)
- Enrolled Actuary, U.S.A (EA)
- Certified Financial Planner (CFP)
- Member of Social Security Committee of the International Actuarial Association
- Member of National Academy of Social Insurance

— Member of New York Academy of Sciences

Awards and Honors

Presidential Appreciation Award, Society of Actuaries, 1998

In *Who's Who in America*, and *Who's Who in the World*