

Digital Healthcare: Bridging Health, Medicine and Welfare

ISGG
19th
The 19th International
Symposium on Geriatrics
and Gerontology

November 30th, 2024

10:00-17:15

Nagoya Convention Hall

日時 | 2024年11月30日(土)

10:00~17:15

ABSTRACTS

デジタルヘルス…健康・医療・福祉をつなぐ



第 19 回長寿医療研究センター国際シンポジウム開催報告

1. 長寿医療研究センター国際シンポジウム

長寿医療研究センター国際シンポジウム (International Symposium on Geriatrics and Gerontology, ISGG) は、2004 年に我が国における 6 番目のナショナルセンターとしてあらたな活動を開始した国立長寿医療研究センター(National Center for Geriatrics and Gerontology, NCGG)において、長寿医療の発展と普及を促進し、老化のメカニズムならびに老化関係疾患の病態解明と治療薬開発に関する新しい情報を発信することを目的に開催されている。毎年 NCGG が主催し、公益財団法人長寿科学振興財団 (The Japan Foundation for Aging and Health) が共催、多くの企業、団体のご後援を得て、センター内からの発表に加え、当該領域を代表する国内外の著名な研究者ならびに医療関係者を招聘し、広く参加者を求め、定例開催を継続している。2024 年 11 月 30 日に開催した今回のシンポジウムで、開催は 19 回を重ね、その評価も定着しつつあるが、今後ますます国際的にも関心の高まる超高齢社会における健康長寿の延伸に向けたさらなる発展をめざすものである。

2. 第 19 回開催のねらい

日本は 2025 年には団塊の世代が 75 歳以上の後期高齢者となり 4 人に 1 人が後期高齢者となる。高齢化する社会での医療・介護・福祉は、従来の資源や提供体制だけでは対応できない喫緊の課題である。これらは日本のみならず、今後世界が直面していく全世界的な課題である。近年はデジタルヘルスツールの進歩がめざましく、遠隔医療から AI を活用した診断に至るまで、高齢者ケアへのアプローチに革命をもたらしている。第 19 回国際シンポジウムでは、これらのデジタルヘルスケアが、高齢者のケアと生活向上のあり方をどのように再構築できるかを探るべく、この領域の世界の英知を結集して、その最新情報を国内外に広く発信することを目的として企画した (タイトル: Digital Healthcare: Bridging Health, Medicine and Welfare.)。

セッション I では、政府や自治体が目指しているヘルスケア政策や取組みの紹介を 2 名の演者にご登壇いただきご発表いただいた。

セッション II は、Google の慈善事業部門である Google.org の支援を受け、長寿科学振興財団が研究助成する、高齢者のデジタルデバイド解消、多世代型地域コミュニティの強化等の実現に取り組む「高齢社会課題解決研究および社会実装活動への助成」における 3 つの研究プロジェクトを 3 名の演者にご発表いただいた。

ランチョンセミナーでは、大学病院と政府のデータ作成・活用推進に関する取組みを概観し、医療ビッグデータ管理成功のための困難と実践的な解決策に

ついでご発表いただいた。

セッションⅢでは、デジタルヘルスケアとビッグデータに関する社会制度と臨床への展開を諸外国での事例を中心に、4名の演者にご発表いただいた。

セッションⅣでは、デジタルヘルスを用いた医療・介護・福祉に関する先進的な研究・取組みについて、3名の研究者に登壇して頂いた。

基調講演では、日本における医療デジタル技術開発の現状と今後の展望についてご講演いただいた。

全体で14人の演者（海外からは4名）にご発表をいただいた。

3. 第19回シンポジウムの概要

今回のシンポジウムの開催に当たって、主催者である国立長寿医療研究センターの荒井 秀典 理事長、共催者である公益財団法人長寿科学振興財団の大島伸一 理事長、第19回国際シンポジウム実行委員会・委員長である櫻井研究所長から、次の挨拶が寄せられた。

※国立長寿医療研究センター 荒井 秀典 理事長の挨拶

Ladies and Gentlemen, esteemed colleagues, and distinguished guests,

It is both an honor and a privilege to welcome you to the 19th International Symposium on Geriatrics and Gerontology (ISGG) hosted by the National Center for Geriatrics and Gerontology (NCGG). The theme of this symposium is “Digital Healthcare: Bridging Health, Medicine and Welfare”. This symposium aims to explore one of the most pressing and transformative topics in the field of aging—how digital healthcare can reshape how we care for and improve the lives of our older people.

As we face the global challenges an aging society poses, the intersection of technology, healthcare, and welfare has never been more critical. Advances in digital health tools, from telemedicine to AI-powered diagnostics, can revolutionize how we approach care for older adults, ensuring better outcomes, more personalized services, and improved accessibility.

This symposium brings together experts, practitioners, and thought leaders from around the world. In addition, we organized a symposium for “ICT-driven Healthy Longevity Society” based on the donation by Google.

Therefore, I am truly excited about the insights, discussions, and collaborations that will emerge from our time together. We will explore the integration of digital solutions into healthcare systems, address the challenges of technology adoption, and envision a future where digital tools are seamlessly woven into the fabric of health, medicine, and welfare.

I would like to extend my heartfelt thanks to all of our speakers, panelists, and attendees for their participation. Your expertise, commitment, and passion are what make this symposium a success, and I am confident that the conversations here will inspire new ideas, partnerships, and actions.

Let us take this opportunity to reflect, innovate, and work together to bridge the gaps that exist in care for older persons, ensuring that we create a future where everyone, regardless of age, can enjoy the benefits of quality, accessible healthcare.

Lastly, I would like to acknowledge the strong endorsement by The Japan Foundation for Aging and Health since the beginning of this symposium.

Thank you, and I look forward to the stimulating discussions ahead.

Warmest regards,

Hidenori Arai

President

National Center for Geriatrics and Gerontology

※公益財団法人長寿科学振興財団 大島 伸一 理事長の挨拶

Dear researchers,

It is a great pleasure for me to have this opportunity to address the 19th International Symposium on Geriatrics and Gerontology on behalf of The Japan Foundation for Aging and Health.

Japan has now become what is referred to as a super-aging society, ranking among the top countries in the world in terms of average life expectancy. Accordingly, living a long and healthy life, not only physically but also mentally, is one of the greatest concerns of most people in the country.

What kind of society is a “longevity society where people are happy to live a long life,” where more and more people can say, as they near the end of their lives, “I’m glad that I lived long,” including all the ups and downs? At The Japan Foundation for Aging and Health, we have been pursuing our vision of a “longevity society where people are happy to live a long life” through our projects.

The theme of the 19th International Symposium is "Digital Healthcare: Bridging Health, Medicine and Welfare" an issue that we must tackle together.

I hope your knowledge exchange and new ideas obtained through the discussion in the symposium will greatly contribute to solving the issue.

In Session 2, "ICT-driven Healthy Longevity Society," The Japan Foundation for Aging and Health, with support from Google.org, launched a project to "provide grants for research into solving problems in an aging society and social implementation activities" to address issues such as eliminating the digital divide for the elderly and strengthening multigenerational local communities. Today, we will announce the progress of the three research projects that were adopted.

The Japan Foundation for Aging and Health is very happy to support the International Symposium on Geriatrics and Gerontology. And thank you very much for all participated in the symposium. Now let's create a society that enjoy longevity together!

Yours sincerely,

Shinichi Ohshima

President

The Japan Foundation for Aging and Health

※第19回長寿医療研究センター国際シンポジウム 実行委員会委員長
櫻井 孝 研究所長の挨拶

Greetings

On November 30, 2024, the 19th International Symposium on Geriatrics and Gerontology will be held. The title of symposium is "Digital Healthcare: Bridging Health, Medicine and Welfare.

Digital healthcare is transforming the way healthcare is delivered and the approach to health care management as technology evolves. Digital technologies are streamlining the management of individual health conditions, making them more accessible and less costly. In particular, the proliferation of telemedicine, health management applications, and wearable devices has made healthcare services more personalized and brought patients and providers closer together.

The most important aspect of digital healthcare is that it helps in preventive care and early detection. Real-time collection and analysis of health data can detect early signs of disease and enable rapid response. Furthermore, diagnostic support tools utilizing AI and machine learning are expected to support physicians' decisions and improve diagnostic accuracy and treatment effectiveness.

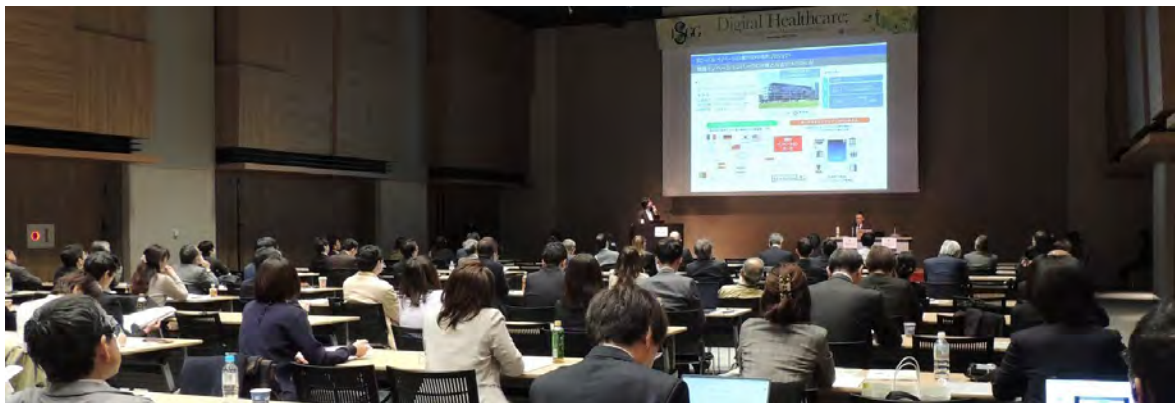
The development of digital healthcare is not limited to simply improving the efficiency of medical care; it also contributes to raising people's health awareness and improving their lifestyles. In addition, analysis of big data accumulated from digital health care makes it possible to understand the current status of medical treatment and prevention in the real world.

I hope that this symposium will contribute to a deeper understanding of digital health care for improving the quality of medical care. Thank you very much for your kind attention.

Sincerely

Takashi Sakurai, MD, PhD
Director, Research Institute
National Center for Geriatrics and Gerontology

〈シンポジウムの開催風景〉



今回のシンポジウムの開催概要ならびにプログラムは表 1 及び表 2 に示すとおりである。

(表 1)

開催概要

催 事 名 : 第 19 回長寿医療研究センター国際シンポジウム
The 19th International Symposium on Geriatrics and Gerontology

テ ー マ : Digital Healthcare : Bridging Health, Medicine and Welfare

開催日時 : 2024 年 11 月 30 日 (土) 10:00~17:15

開催場所 : 名古屋コンベンションホール
(愛知県名古屋市中村区平池町 4-60-12 グローバルゲート)

主 催 : 国立研究開発法人国立長寿医療研究センター

共 催 : 公益財団法人長寿科学振興財団

後 援 : 一般社団法人日本老年医学会、一般社団法人日本認知症学会、一般社団法人日本神経学会、一般社団法人日本神経科学学会、一般社団法人日本サルコペニア・フレイル学会、国立大学法人東海国立大学機構名古屋大学、名古屋市立大学、藤田医科大学病院、愛知医科大学、三重大学、国立大学法人浜松医科大学、国立大学法人東海国立大学機構岐阜大学、地方独立行政法人東京都健康長寿医療センター、厚生労働省、経済産業省、愛知県、名古屋市、大府市、東浦町、朝日新聞社、毎日新聞社、読売新聞社、東海テレビ放送、中京テレビ放送株、CBCテレビ、メ〜テレ、テレビ愛知、中日新聞社、知多メディアネットワーク株式会社

使用言語 : 午前 / 日本語、午後 / 英語 (同時通訳あり)

座長・講演者 : 海外 4 名、国内は NCGG の 3 名を含めた 11 名、合計 15 名

参加人数 : 会場 / 104 人

オンライン視聴人数 / 日本語 LIVE 364 人、英語 LIVE 69 人 (延人数)

(表 2)
プログラム

10:00～10:05 開会の辞

国立長寿医療研究センター 理事長 荒井 秀典 先生

Session I : Healthcare Policy in Japan

座長：国立長寿医療研究センター 島田 裕之 先生

1. Recent Developments in Health Care Industry Policy

経済産業省 橋本 泰輔 様

2. あいちデジタルヘルスプロジェクトについて

愛知県 柴山 政明 様

Session II : ICT-driven Healthy Longevity Society

Research project by The Japan Foundation for Aging and Health

座長：名鉄病院 葛谷 雅文 先生

国立長寿医療研究センター 齋藤 民 先生

Greeting : Google 合同会社 AI for Japan パートナーシップ開発マネージャー
加山 博規 様

1. Create active communities by promoting smartphone use among older adults

国立長寿医療研究センター 島田 裕之 先生

**2. Development and Implementation of a Digital Skills Learning Ecosystem
Using a ‘Manabiai’ Program**

東北大学 瀧 靖之 先生

**3. Integrating Jobs and Volunteering in the Community through Digital
Matching: Toward a Society with a Role for All**

東京都健康長寿医療センター 村山 洋史 先生

Luncheon Seminar

座長：国立長寿医療研究センター 大寺 祥佑 先生

How to promote production and use of healthcare big data

京都大学 黒田 知宏 先生

Session III : Social System with Digital Healthcare and Big Data, and Application to Care

座長：京都大学 黒田 知宏 先生

国立長寿医療研究センター 大西 丈二 先生

1. Finnish health and social care infrastructure and national “Kanta” health information exchange

University of Oulu Jarmo Reponen 先生（フィンランド）

2. Start of Long-term Care Information System for Evidence (LIFE)

国立長寿医療研究センター 土井 剛彦 先生

3. Digital Healthcare for Healthy Longevity: Innovations in Predictive Analytics and Community-Centered Care Models

National Yang Ming Chiao Tung University Liang-Kung Chen 先生（台湾）

4. From Global Roadmap to Township Implementation

National University of Singapore John Eu-Li Wong 先生（シンガポール）

Session IV : Progress of Digital Healthcare

座長：東京都健康長寿医療センター 笹井 浩行 先生

国立長寿医療研究センター 大塚 礼 先生

1. Our attempt to detect frailty and cognitive decline

東京都健康長寿医療センター 大淵 修一 先生

2. Application of Digital Technology to Keep Health for Older Adults

国立長寿医療研究センター 高野 映子 先生

3. ADVANCING FALL PREVENTION WITH DIGITAL HEALTH

Neuroscience Research Australia Kim Delbaere 先生（オーストラリア）

Session V : Keynote

座長：国立長寿医療研究センター 荒井 秀典 先生

Digital Technology for Extension of Healthy Lifespan

自治医科大学 永井 良三 先生

17:10～17:15 閉会の挨拶

国立長寿医療研究センター 櫻井 孝 先生

Recent Developments in Health Care Industry Policy

橋本泰輔

経済産業省 商務情報政策局 商務・サービスグループ
ヘルスケア産業課

Summary

少子高齢化・人口減少という課題を抱える日本にとって、健康がもたらす価値は益々高まっている。そうした背景の下、経済産業省では、国民の健康増進に産業政策的観点から貢献することを目指して取り組んでおり、その概要を御紹介する。

Education

2002 東京大学法学部卒

Professional Experiences

2002年経済産業省入省。経済成長戦略、地球温暖化対策、産業人材政策、原子力政策、中小企業政策などに携わり、サントリーホールディング株式会社への出向を経て、2022年7月より現職。

Contact Information

Name 橋本泰輔

Address 東京都千代田区霞が関1-3-1

Phone: 03-3501-1511

e-mail: Hashimoto-taisuke@meti.go.jp

あいちデジタルヘルスプロジェクトについて

柴山 政明

愛知県経済産業局

Summary

愛知県は、日本最大のスタートアップ・オープンイノベーションの拠点「STATION Ai」を中核として、グローバルイノベーション都市への飛躍を目指し、様々なイノベーションプロジェクトを推進している。その取組の一環として、2023年9月に「あいちデジタルヘルスプロジェクト」を立ち上げた。このプロジェクトは、デジタル技術を活用して、健康寿命の延伸と生活の質の維持・向上に貢献するサービスを創出することを目的としている。本プロジェクトの推進母体である「あいちデジタルヘルスコンソーシアム」には、国立長寿医療研究センターを中核とする研究機関・大学、民間企業、自治体などが参画し、産学官金が一体となった取組を推進している。具体的には、新サービスの創出に向けた実証実験・社会実装の支援や、オンラインによる効果的なサービスの提供とサービス利用者のライフログデータの活用に向けた基盤の構築などを進めていく。このプロジェクトを通じて、「誰もが安心して、元気に暮らせるあいち」、研究機関や企業が集積する「健康長寿産業都市あいち」の実現を目指している。

Education

南山大学大学院総合政策研究科 博士課程後期単位取得退学

Professional Experiences

1985	愛知県庁入庁 企画政策部門（企画課、交通対策課、知事公室〔政策調整〕）、総務部門（財政課、法務文書課、自治研修所）を歴任
2018-2019	中小企業金融課長
2019-2022	スタートアップ推進課長
2022-2023	革新事業創造部長
2023-2024	経済産業推進監
2024-現在	経済産業局顧問
2023-現在	名古屋大学ディープテック・シリアルイノベーションセンター 客員教授
2024-現在	名古屋工業大学 客員教授

資格

- MBA (AACSB、AMB A 国際認証)
- 中小企業診断士
- 宅地建物取引士

主な研究分野

総合政策

Contact Information

Name 柴山 政明 (愛知県庁 経済産業局顧問)

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Create active communities by promoting smartphone use among older adults

Hiroyuki Shimada

Gerontology and Social Science, National Center for Geriatrics and Gerontology

Summary

In this project, local volunteers led a class to promote smartphone use among the elderly, and examined the effect on healthy life expectancy extension by forming a community that supports the improvement of the elderly's activity through the use of an application. Through the use of the smartphone application developed by the National Center for Geriatrics and Gerontology, the activity and digital skills of the elderly were improved. The outcome goals were: 1) to create 100 local communities in 50 cities, towns, and villages; 2) to have 4,500 elderly people participate in these communities and learn digital skills with young people; 3) to have at least 13% (600 people) of all elderly people continue to participate in these communities for at least 6 months; and 4) to have at least 1,000 elderly people who find these communities beneficial and who have increased their confidence in their digital skills. 4) 70% of the total number of older adults who reported that the community was beneficial and increased their confidence in their digital skills, and 5) 60% of the total number of older adults who reported that their happiness/quality of life improved after participating in the program. Results to date will be reported.

Education

2000 M.S. (Rehabilitation Medicine), Kitasato University

2003 Ph.D. (Rehabilitation Medicine), Kitasato University

Professional Experiences

2003 Researcher, Department of Prevention for Long-Term Care, Tokyo Metropolitan Institute of Gerontology

2005 Visiting researcher, Prince of Wales Medical Research Institute 2006 Researcher, Department of Prevention for Long-Term Care, Tokyo Metropolitan Institute of Gerontology

2010 Chief, Section of Health Promotion, Department of Support for Independence, Center for Gerontology and Social Science, National Center for Geriatrics and Gerontology

2014 Division head, Department for Preventive Gerontology, Center for Gerontology and Social Science, National Center for Geriatrics and Gerontology

2015- Division head, Department for Preventive Gerontology, Center for

Gerontology and Social Science, National Center for Geriatrics and Gerontology
2015-Present Visiting Professor, Nagoya University
2015-Present Visiting Professor, Shinshu University
2019-Present Director, Center for Gerontology and Social Science, National Center for Geriatrics and Gerontology
2019-Present Visiting Professor, Doshisha University
2024-Present Visiting Professor, Tokyo Metropolitan University

Honors and Awards

2010 Journal of Japanese Physical Therapy Association Best Article Award
2010 Geriatrics & Gerontology International Best Article Award
2011 Bio Med Lib Top 10 article
2011 Journal of Physical Therapy Science Outstanding Paper Award
2015 Award of aging and health science, The Japan Foundation for Aging and Health
2015 Award of the 50th Congress of Japanese Society of Physical Therapy
2019 Outstanding Theme Award, The 61st Academic Gathering of the Japanese Society of Geriatrics
2019 Urakami Award, The 9th annual meeting e of the Japanese Society for Dementia Prevention
2023 World Physiotherapy Congress Outstanding Poster Award

Major Research Interest

- ❑ Scientific verification of the effectiveness of non-pharmacological therapies such as exercise, nutrition, and intellectual activities in preventing dementia and physical frailty and development of programs to prevent caregiving
- ❑ Establishment of comprehensive methods to prevent frailty and dementia in the community
- ❑ Extension of driving life
- ❑ Sustainable prevention of social isolation and loneliness among the elderly
- ❑ Research on establishing comprehensive methods for preventing frailty and dementia in the community

Recent Publications (Selected)

1. Shimada H, Ishii H, Doi T, Tsutsumimoto K, Nakakubo S, Kurita S, Arai H. Study protocol of the safe driving program for the prevention of car accident: A randomized controlled trial protocol. *Geriatr Gerontol Int*, 2024. [in press]
2. Shimoda T, Tomida K, Nakajima C, Kawakami A, Tsutsumimoto K, Shimada H. Prevalence

- and Prognostic Impact of Multiple Frailty Domain in Japanese Older Adults. *J Am Med Dir Assoc*, 25(11): 105238, 2024. [Epub ahead of print]
3. von Fingerhut G, Makino K, Katayama O, Yamaguchi R, Yamagiwa D, Bone JK, Shimada H. Associations between Japanese calligraphy practice and sleep quality in community-dwelling older adults: A cross-sectional Study. *Sleep Medicine*: X, 8: 100124, 2024. [Epub ahead of print]
 4. Nishimoto K, Tsutsumimoto K, Nakakubo S, Kiuchi Y, Misu Y, Ohata T, Shimada H. Association between physical, cognitive, and social activities with the incident of sarcopenia among community-dwelling older adults: a 4-year longitudinal study. *Eur Geriatr Med*, 2024. [Epub ahead of print]
 5. Kiuchi Y, Makizako H, Kimura M, Nakai Y, Taniguchi Y, Akaida S, Tateishi M, Kubozono T, Takenaka T, Shimada H, Ohishi M. Association of combined low physical activity and low dietary diversity with mild cognitive impairment among community-dwelling Japanese older adults. *Ann Geriatr Med Res*, 2024. [Epub ahead of print]
 6. Kawakami A, Tomida K, Shimoda T, Nakajima C, Shimada H. Association between social isolation and diversity in food intake by gender in communitydwelling older adults: A cross-sectional study. *Geriatr Gerontol Int*, 2024. [Epub ahead of print]
 7. Kakita D, Harada K, Kurita S, Morikawa M, Nishijima C, Fujii K, Shimada H. Impact of fat to muscle ratio with risk of disability on community-dwelling Japanese older adults: A 5-year longitudinal study. *Arch Gerontol Geriatr*, 126: 105524, 2024. [Epub ahead of print]
 8. Shimoda T, Tomida K, Nakajima C, Kawakami A, Doi T, Shimada H. Impact of working time and industry type on disability incidence among older Japanese adults. *Discover Public Health*, 21(1): 10, 2024. [Epub ahead of print]
 9. Shimoda T, Tomida K, Nakajima C, Kawakami A, Shimada H. Combined effects of loneliness and diabetes mellitus on disability incidence among older Japanese adults. *Arch Gerontol Geriatr*, 126: 105544, 2024. [Epub ahead of print]
 10. Katayama O, Stern Y, Habeck C, Coors A, Lee S, Harada K, Makino K, Tomida K, Morikawa M, Yamaguchi R, Nishijima C, Misu Y, Fujii K, Kodama T, Shimada H. Detection of neurophysiological markers of cognitive reserve: an EEG study. *Front Aging Neurosci*, 16: 1401818, 2024.

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Development and Implementation of a Digital Skills Learning Ecosystem Using a ‘Manabiai’ Program

Yasuyuki Taki

Professor, Institute of Development, Aging and Cancer,
Director, Smart Aging Research Center,
Tohoku University

Summary

Under the slogan of “people-friendly digitalization where no one is left behind,” the government is working to realize a society where everyone can enjoy the benefits of digitalization, but the problem of the information gap (digital divide) surrounding the elderly (seniors) still remains. Based on the limitations of conventional digital skills learning strategies and the real needs of today's seniors, this project aims to develop and implement a program that enables more seniors to enjoy learning digital skills while feeling connected to society, in cooperation with NTT Communications, Inc. The SENdai Smart Inclusion: SENSIN Project is an industry-government-academia collaborative team with NTT Communications and the City of Sendai to develop and implement a program that enables more seniors to enjoy learning digital skills while feeling connected to society.

The project incorporated a multi-generational, mutually supportive “learning together” approach into the program as a strategy for learning digital skills in a fun way while feeling connected to society. Specifically, we developed teaching materials for learning basic smartphone operation and applications to motivate learning, and incorporated university students as supporters in classrooms where seniors learn basic smartphone skills, creating a system for learning skills through intergenerational interaction. In the actual program, a training program was implemented to teach others using role-playing and other active learning techniques. In addition, seniors who acquired basic skills in the program's smart classrooms were certified as Smart Teachers (Smarties), and eventually more than 100 seniors were certified as Smarties. Furthermore, a framework was established for seniors certified as Smarties to shift from “those who teach to those who teach,” and a demonstration test was conducted in the community in cooperation with private smartphone class management organizations and smartphone carrier companies. At the individual level, the project also worked to spread digital technology at the grassroots level by promoting the “Smarty Experience,” an activity in which Smarties teach basic smartphone skills to family members and neighborhood seniors on a daily basis. This symposium will introduce these efforts toward social implementation and future prospects.

Education

- 1993 Bachelor of Science, Tohoku University
- 1999 B.A. Tohoku University School of Medicine
- 2003 Doctoral Program, Graduate School of Medicine, Tohoku University
- 2003 M.D. Tohoku University

Professional Experiences

2003-2004	Clinical Fellow, Tohoku University Hospital
2004-2007	Research associate, Institute of Development, Aging and Cancer, Tohoku University
2007-2008	Assistant professor, Tohoku University Hospital
2008-2012	Associate professor, Institute of Development, Aging and Cancer, Tohoku University
2012-2013	Professor, Tohoku University Tohoku Medical Megabank Organization
2013-2016	Professor, Institute of Development, Aging and Cancer, Tohoku University
2017-2023	Professor and Deputy director, Smart Aging Research Center, Tohoku University Professor, Institute of Development, Aging and Cancer, Tohoku University
2023-	Professor and Director, Smart Aging Research Center, Tohoku University Professor, Institute of Development, Aging and Cancer, Tohoku University

Honors and Awards

The Representative, The Japan Geriatrics Society

- 2004 Best Paper Award, Japanese Neural Network Society
- 2004 Excellence Exhibition Award, The 60th Autumn Assembly of the Japan Radiological Society
- 2006 Best Paper Award, Japanese journal of Clinical Radiology
- 2006 Bronze Award, The 60th Autumn Assembly of the Japan Radiological Society

Major Research Interest

- ❑ Research on brain development and aging using a large brain MRI database
- ❑ Research on maintenance of healthy brain throughout life, extension of healthy life span, and prevention of dementia

Recent Publications (Selected)

1. Shinada T, Kokubun K, Takano Y, Iki H, Kobayashi K, Hamasaki T, Taki Y. Effects of natural reduced water on cognitive functions in older adults: A RCT study. *Heliyon*. 2024 Sep 28;10(19):e38505. doi: 10.1016/j.heliyon.2024.e38505.
2. Liu Y, Thyreau B, Cui Y, Zhang Y, Tatewaki Y, Taki Y. Influence of intergenerational social mobility on brain structure and global cognition: findings from the Whitehall II study across 20 years. *Age Ageing*. 2024 Oct 1;53(10):afae221. doi: 10.1093/ageing/afae221.
3. Nakase T, Thyreau B, Tatewaki Y, Tomita N, Takano Y, Muranaka M, Taki Y. Association between Gray and White Matter Lesions and Its Involvement in Clinical Symptoms of Alzheimer's-Type Dementia. *J Clin Med*. 2023 Dec 12;12(24):7642. doi: 10.3390/jcm12247642.
4. Mutoh T, Mutoh T, Kurosaki H, Taki Y. Effects of Hippotherapy on Health-Related Quality of Life in Caregivers of Children with Cerebral Palsy: A Pilot

- Quasi-Experimental Study in Japan. *Healthcare (Basel)*. 2023 Dec 15;11(24):3175. doi: 10.3390/healthcare11243175.
5. Matsudaira I, Yamaguchi R, Taki Y. Transmit Radiant Individuality to Offspring (TRIO) study: investigating intergenerational transmission effects on brain development. *Front Psychiatry*. 2023 Sep 28;14:1150973. doi: 10.3389/fpsyt.2023.1150973.
 6. Zhang Y, Tatewaki Y, Nakase T, Liu Y, Tomita N, Thyreau B, Zheng H, Muranaka M, Takano Y, Nagasaka T, Taki Y. Impact of hs-CRP concentration on brain structure alterations and cognitive trajectory in Alzheimer's disease. *Front Aging Neurosci*. 2023 Aug 1;15:1227325. doi: 10.3389/fnagi.2023.1227325.
 7. Tomita N, Ohashi Y, Ishiki A, Ozaki A, Nakao M, Ebihara S, Taki Y. Detecting Comparative Features of Comprehensive Geriatric Assessment through the International Classification of Functioning, Disability, and Health Linkage: A Web-Based Survey. *J Clin Med*. 2023 Jul 26;12(15):4917. doi: 10.3390/jcm12154917.
 8. Nakase T, Tatewaki Y, Thyreau B, Odagiri H, Tomita N, Yamamoto S, Takano Y, Muranaka M, Taki Y. Impact of atrial fibrillation on the cognitive decline in Alzheimer's disease. *Alzheimers Res Ther*. 2023 Jan 13;15(1):15. doi: 10.1186/s13195-023-01165-1.
 9. Nakase T, Tatewaki Y, Thyreau B, Mutoh T, Tomita N, Yamamoto S, Takano Y, Muranaka M, Taki Y. Impact of constipation on progression of Alzheimer's disease: A retrospective study. *CNS Neurosci Ther*. 2022 Dec;28(12):1964-1973. doi: 10.1111/cns.13940.
 10. Tatewaki Y, Mutoh T, Sato H, Kobayashi A, Totsune T, Thyreau B, Sekiguchi A, Nakase T, Yagi T, Taki Y. Impact of Catheter Ablation on Brain Microstructure and Blood Flow Alterations for Cognitive Improvements in Patients with Atrial Fibrillation: A Pilot Longitudinal Study. *J Clin Med*. 2022 Jul 26;11(15):4346. doi: 10.3390/jcm11154346.

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Integrating Jobs and Volunteering in the Community through Digital Matching: Toward a Society with a Role for All

Hiroshi Murayama

Tokyo Metropolitan Institute for Geriatrics and Gerontology

Summary

Since 2023, three municipalities (Wako City, Saitama Prefecture; Hachioji City, Tokyo; and Itabashi Ward, Tokyo) have been working on the “creation of a mechanism for matching elderly people with jobs and volunteer work (hereafter ‘Job-Vol’) using digital technology,” with the goal of promoting employment and social participation during old age. Specifically, Wako City and Hachioji City targeted those who are active in social participation, while Itabashi Ward targeted those who are passive in social participation:

- (1) Cultivation of new elderly users: Holding training sessions on how to use the application
- (2) Cultivate new Job-Vol users: Identify tasks that can be handled by elderly people.
- (3) Matching using the app (coordinators provide support as needed)

To date, a total of 535 health/medical/welfare-related offices and 4 regional organizations have created Job Volunteers in the 3 fields. In addition, 9,791 people have registered for the app and 598 matches have been established (as of the end of September 2024). The presentation will provide an overview of the initiative, its progress, issues to be cleared, and the future potential of digital-based matching.

Education

- 2002 BS in Health Science (The University of Tokyo)
- 2006 MS in Health Science (The University of Tokyo)
- 2009 PhD in Health Science (The University of Tokyo)
- 2018 MPH (Teikyo University)

Professional Experiences

- 2009-2010 Assistant Professor at Institute of Gerontology, The University of Tokyo, Tokyo, Japan
- 2010-2015 Research Associate at Research Team for Social Participation and Community Health, Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan
- 2012-2014 Postdoctoral fellow of the Uehara Memorial Foundation at University of Michigan School of Public Health, MI, USA
- 2015-2020 Lecturer at Institute of Gerontology, The University of Tokyo, Tokyo,

Japan

2020-present Vice-Director at Research Team for Social Participation and Healthy Aging, Tokyo Metropolitan Institute for Geriatrics and Gerontology, Tokyo, Japan

Honors and Awards

2012 Research Award from the Japanese Society of Public Health
2015 Young Investigator Award from The Japan Foundation for Aging and Health
2020 Research Award from the Japan Epidemiological Association
2016-present Associate Editor of the Journal of Epidemiology
2019-present Associate Editor of the Geriatrics & Gerontology International
2022-present Board Member of the Japan Socio-Gerontological Society

Major Research Interest

- Community-based intervention research for frailty prevention
- Social environment and healthy aging
- Effect of employment and engagement in social activities on health in old age

Recent Publications (Selected)

1. Murayama H, Iizuka A, Machida M, Amagasa S, Inoue S, Fujiwara T, Shobugawa. Impact of social isolation on change in brain volume in communitydwelling older Japanese people: The NEIGE Study. Archives of Gerontology and Geriatrics 2024; 105642.
2. Murayama H, Nakamoto I, Takase M, Sagara T, Sugiura K, Higashi K, Fujiwara Y. Older assistant care workers as late-life employment in Japan: Perceived benefits from work and emotional exhaustion. Geriatrics & Gerontology International 2024; 24(Suppl 1): 415-417.
3. Murayama H, Sugiyama M, Inagaki H, Ura C, Miyamae F, Edahiro A, Motokawa K, Okamura T, Awata S. The relationship between cognitive decline and all-cause mortality is modified by living alone and a small social network: A paradox of isolation. Journal of Gerontology: Psychological Sciences & Social Sciences 2023; 78(11): 1927-1934.
4. Murayama H, Sasaki S, Takahashi Y, Takase M, Taguchi A. Message framing effects on attitude and intention toward social participation in old age. BMC Public Health 2023; 23: 1713.
5. Murayama H, Takagi Y, Tsuda H, Kato Y. Applying nudge to public health policy: Practical examples and tips for designing nudge interventions. International Journal of Environmental Research and Public Health 2023; 20(5): 3962.
6. Murayama H, Shimada S, Morito K, Maeda H, Takahashi Y. Evaluating the

- effectiveness of letter and telephone reminders in promoting the use of specific health guidance in an at-risk population for metabolic syndrome in Japan: A randomized controlled trial. *International Journal of Environmental Research and Public Health* 2023; 20(5): 3784.
7. Murayama H, Suda T, Nakamoto I, Shinozaki T, Tabuchi T. Changes in social isolation and loneliness prevalence during the COVID-19 pandemic in Japan: The JACSIS 2020–2021 study. *Frontiers in Public Health* 2023; 23(3): 234-238.
 8. Murayama H, Takase M, Watanabe S, Sugiura K, Nakamoto I, Fujiwara Y. Employment in old age and all-cause mortality: A systematic review. *Geriatrics & Gerontology International* 2022; 22(9): 705-714.
 9. Murayama H, Kurotani K, Tabuchi T. Social capital and the spread of children's cafeterias (kodomo shokudo) in Japan: A ecological analysis. *Asia Pacific Journal of Public Health* 2022; 34(8): 817-820.
 10. Murayama H, Sugawara I. Can online relationships in social networking services supplement offline relationships during the COVID-19 pandemic? *Asia Pacific Journal of Public Health* 2022; 34(2-3): 282-285.

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How to promote production and use of healthcare big data

Tomohiro Kuroda

Kyoto University

Summary

Healthcare big data is indispensable for epidemiology as well as generation of Artificial Intelligences (AIs). Especially, recent advancement of Healthcare AI increases the demand for the healthcare big data. Thus, innumerable trials to produce repositories and promote use of them are performed by both private academic parties and governments. However, the most of them seems suffering side-effect of the production, backlash from medical professionals and patients. This lecture overviews data production and promotion activities of Kyoto University Hospital and Japanese Government to know about difficulties and solutions for successful big-data management.

Data strategy of Japan is supported by its healthcare insurance system. It is mandatory for any habitants of Japan to be a member of national health insurance system. Almost all clinical cares are reimbursed by the insurance system which is based on fee-for-service payment system. All the reimbursement request, called “receipt,” are submitted to insurance bodies via the payment examination organization. Therefore, a database named NDB which stores all the receipt sent to the payment examination organization captures whole clinical care activities performed in Japan. Once all other public or private repositories which contains clinical outcomes, and death certificate submitted to local governments are connected to NDB and made accessible, it may promote data sciences and businesses. The 2023 amendment of the Next Generation Medical Infrastructure Act enables the certified producer of anonymized and pseudonymized health data to concatenate any healthcare data using national health ID and provide the concatenated data set to the researchers. Japanese government is enabling all government holding databases.

Quality of the repositories are simply relying on the cooperations of data producers called health care professionals, especially physicians and nurses. However, physicians and nurses are not motivated to provide detailed structured healthcare data simply because the recording is additional labor for them. The increasing demand for structured input using templated makes the situation worse. Plausible tools for the input load reduction is the Internet of Things (IoT) Technologies and emerging generative AIs. Kyoto University Hospital (KUHP) introduces IoT, more precisely Bluetooth Low Energy proximity sensors and medical devices equips near field communication (NFC) function for recording activities performed at the bedsides. KUHP is also equipped generative AI for semi-automatic clinical record summarization to reduce physicians' load. Future development of automatic activity recognition technologies and generative AIs may free physicians and nurses from whole recording task.

Education

Bachelor of Engineering, Kyoto University, Kyoto, 1994.

Master of Engineering, Nara Institute of Science and Technology, Ikoma/Nara, 1996.

Doctor of Philosophy, Nara Institute of Science and Technology, Ikoma/Nara, 1998.

Professional Experiences

- 1998-2001 Assistant Professor, Graduate School of Information Science, Nara Institute of Technology and Science, Japan.
- 2001-2001 Visiting Research Professor, School of Information Processing Science, University of Oulu, Finland.
- 2001-2007 Senior Lecturer, Kyoto University Hospital, Japan.
- 2006-2006 Visiting Professor, School of Information Processing Science, University of Oulu, Finland.
- 2007-2009 Associate Professor, Graduate School of Engineering Science, Osaka University, Japan.
- 2009-2013 Associate Professor, Kyoto University Hospital, Japan.
- 2013-present Professor, Graduate School of Medicine, Kyoto University, Japan.
Professor, Graduate School of Informatics, Kyoto University, Japan.
Director, Division of Medical Information Technology and Administration Planning, Kyoto University Hospital, Japan. Assistant of the Director of Hospital (Chief Information Officer), Kyoto University Hospital, Japan.
- 2022-present Director, Center for Digital Transformation of Healthcare, Kyoto University, Japan.

Honors and Awards

- 1995 Best Video Presentation Award, Human Interface Division of the Society of Instruments and Control Engineers.
- 1998 Encouragement Award, The Institute of Systems, Control and Information Engineers
- 2000 Encouragement Award, Human Interface Society of Japan
- 2000 ABE Award, Japanese Association of Medical and Biological Engineers.
- 2003 Award of Outstanding Paper, International Conference on Artificial Reality and Tele-existence
- 2004 Best Paper Award, Virtual Reality Society of Japan.
- 2012 Best Short Paper Award, Conference on Disability, Virtual Reality and Associated Technologies.
- 2015 Best Organized Session Paper Award, Human Communication Group, the Institute of Electronics, Information, and Communication Engineers.

2018 Best Paper Award Third Place, MEDINFO.

Major Research Interest

- Human-Computer Interaction.
- Computer Mediated Human-Human Interaction.
- Wearable and Ubiquitous Computing.

Recent Publications (Selected)

1. Medical Information System. Libraries of Modern Electrics, Information and Communication Technologies -Forest of Knowledge-, Ohmsha (2012) Japanese.
2. Wearable Sensors -Fundamentals, Implementation and Applications-, Chapter X : Woven Electronic Textiles (2014/2020)
3. Medical Engineering Web Dictionary. (2022)

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Finnish health and social care information infrastructure and national “KANTA” health information exchange

Prof. Jarmo Reponen, MD, PhD

Research Unit of Health Sciences and Technology,
University of Oulu, Finland

Summary

Finland has been at the forefront of digitalization among European Union Member States, according to the European Commission Digital Economy and Society Index (DESI) studies. In Finnish public healthcare, all new patient information has been stored locally in electronic health records (EHR) already by 2010, followed by private care providers. In addition, since 2010 Finland has been building a national health information exchange (HIE) and data repository called KANTA. Its main components are: 1) electronic prescription and pharmaceutical database, 2) medical data repository, and 3) citizen access to data. After 2020, all service providers have been using the HIE, and only electronic prescriptions are legal. In Finland, the entire EHR is stored in KANTA, not just patient summary information. All citizens have access to their own health data, and one-fifth of the population uses the system monthly. Local and regional healthcare service providers use KANTA for retrieving data from other healthcare organizations. KANTA is based on international standards like HL7 CDA and DICOM, and new standards like HL7 FHIR are being investigated for mobile applications. Currently, KANTA is being extended to social care, where services like nursing homes and ambulatory home services are starting to store their client information. In the 2023 health reform, all public health and social care providers were joined administratively into 23 welfare service counties, each building their common regional healthcare information systems. As a result, Finland has a comprehensive information infrastructure to share healthcare information (and in the future also social care information) both in the regional and national level, including public and private service providers and individual citizens.

Education

- Licentiate of Medicine, University of Oulu, 1985
- Specialist in Radiology, University of Oulu, 1992
- Doctor of Medical Science, University of Oulu, 2010

Professional Experiences

1985-1987	Junior medical doctor, Seinäjoki, Kiiminki, Raahe local hospitals
1987-1988	Assistant chief physician, Raahe district primary care health centre
1988-1992	Resident, Department of Radiology, Oulu University Hospital

1992-1997	Assistant Chief Radiologist, Raahe Hospital
1997-2017	Chief Radiologist, Raahe Hospital
1996-2005	Project manager for EHR (part time), Oulu University Hospital
2003-2013	Research Manager, FinnTelemedicum centre (part time), Univ. of Oulu
2013-2017	Professor of Healthcare Information Systems (part time), Univ. of Oulu
2017-2022	Professor of Practice, Healthcare Information Systems, Univ. of Oulu
2023-present	Professor of Healthcare Information Systems, University of Oulu

Honors and Awards

- 2011 Finnish eHealth prize, by Finnish Society of Telemedicine and eHealth
- 2012 Pro Raahe medal, by City of Raahe ...
- 2016 Carl Wegelius medal, by Radiological Society of Finland
- 2017 Knight First Class of the Order of the White Rose of Finland, by Republic of Finland
- 2021 Louis Lareng – Lifetime Achievement Award, by International Society for Telemedicine & eHealth

Major Research Interest

- Health information systems, their availability, use and user experience
- Teleradiology, Telemedicine and eHealth solutions
- Artificial intelligence and machine learning in healthcare
- Health technology assessment (HTA) for digital health applications
- Digitalization in medical and dental education and training

Recent Publications (Selected)

1. Isosalo A, Inkinen SI, Prostreďná L, Heino H, Ipatti PS, Reponen J, Nieminen MT. (2024) Breast cancer imaging phenotype evaluation from digital breast tomosynthesis data: a preliminary study. *Computers in Biology and Medicine*, 183:109285. ISSN 0010-4825. <https://doi.org/10.1016/j.compbimed.2024.109285>
2. Hyrkäs P, Reponen J, Kanste O. (2024) Managing innovation activities in a public university hospital: staff perceptions. *International Journal of Innovation and Learning*, 36(4):488-507. <https://doi.org/10.1504/IJIL.2025.10061651>
3. Haverinen J, Harju T, Mikkonen H, Liljamo P, Turpeinen M, Reponen J. (2024) Digital Care Pathway for Sleep Apnea Patients in Specialized Care: Mixed Methods Study. *JMIR Human Factors*, 11:e47809. <https://doi.org/10.2196/47809>
4. Faxvaag A, Reponen J, Hardardottir GA, Vehko T, Viitanen J, Eriksen J, Koch S, Nøhr C. (2024) Towards accountable e-health policies in the Nordic countries. In: J. Mantas, A. Hasman, G. Demiris, K. Saranto, M. Marschollek, T. N. Arvanitis, I. Ognjanović, A. Benis, P. Gallos, E. Zoulias, , E. Andrikopoulou

- (Eds.), *Studies in Health Technology and Informatics* 316:339-343. IOS Press.
<https://doi.org/10.3233/SHTI240413>
5. Eriksen J, Hjerimitslev CB, Reponen J, Hardardottir GA, Tuulikki V, Faxvaag A, Nøhr C. Nordic Citizens' Willingness to Share Digital Health Data. (2024) In: J. Mantas, A. Hasman, G. Demiris, K. Saranto, M. Marschollek, T. N. Arvanitis, I. Ognjanović, A. Benis, P. Gallos, E. Zoulias, & E. Andrikopoulou (Eds.), *Studies in Health Technology and Informatics* 316:120-124. <https://doi.org/10.3233/SHTI240359>. PMID: 39176688.
 6. Isosalo A, Inkinen SI, Turunen T, Ipatti PS, Reponen J, Nieminen MT (2023) Independent evaluation of a multi-view multi-task convolutional neural network breast cancer classification model using Finnish mammography screening data, *Computers in Biology and Medicine*, 161:107023. <https://doi.org/10.1016/j.combiomed.2023.107023>
 7. Veikkolainen P, Tuovinen T, Jarva E, Tuomikoski AM, Männistö M, Pääkkönen J, Pihlajasalo T, Reponen J. (2023) eHealth Competence Building for Future Doctors and Nurses – Attitudes and Capabilities. *International Journal of Medical Informatics*, 169:104912. <https://doi.org/10.1016/j.ijmedinf.2022.104912>.
 8. Haverinen J, Turpeinen M, Falkenbach P, Reponen J. (2022) Implementation of a new Digi-HTA process for digital health technologies in Finland. *International Journal of Technology Assessment in Health Care* 38(1): E68. <https://doi.org/10.1017/S0266462322000502>.
 9. Haverinen J, Keränen N, Tuovinen T, Ruotanen R, Reponen J. (2022) eHealth Maturity in Finnish Public Health Care – National Development and Regional Differences: Survey Study. *JMIR Medical Informatics* 10(8): e35612. <https://doi.org/10.2196/35612>.
 10. Viitanen J, Hyppönen H, Lääveri T, Vänskä J, Reponen J, Winblad I. (2011) National questionnaire study on clinical ICT systems proofs: physicians suffer from poor usability. *International Journal of Medical Informatics* 80(10):708-25. <https://doi.org/10.1016/j.ijmedinf.2011.06.010>

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Start of Long-term Care Information System for Evidence (LIFE)

Takehiko Doi

Department of Preventive Gerontology, Center for Gerontology and Social Science,
National Center for Geriatrics and Gerontology

Summary

Japan has a high population aging rate, with a particularly high proportion of the elderly in the later stages of life. As a result, the number of people certified as requiring longterm care and using long-term care services is on the rise. In particular, the number of people aged 85 and over is expected to continue to increase, and the number of people certified as requiring long-term care is expected to rise because of the high certification rate for this age group. The Long-Term Care Information System for Evidence (LIFE) was launched in 2021 as an initiative to promote scientific care. In this article, we will discuss the background of the launch of “LIFE” and its overview.

Education

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR (s)	FIELD OF STUDY
Kobe University School of Medicine Faculty of Health Sciences	B.S., P.T.	2003-2007	Physical Therapy
Kobe University Graduate School of Health Sciences	M.S.	2007-2009	Rehabilitation Medicine
Kobe University Graduate School of Health Sciences	Ph.D.	2009-2012	Rehabilitation Medicine

Professional Experiences

2007–2010 Physical therapist, Medicare system Rehabilitation Center Nishinomiya, Japan

2010-2017 Research Fellow, National Center for Geriatrics and Gerontology, Japan

2013-2015 Research Fellow, Japan Society for the Promotion of Science, Japan

2015 Visiting Postdoctoral Fellow, Albert Einstein College of Medicine, Bronx, NY

2018- Section chief, National Center for Geriatrics and Gerontology, Japan Honors and Awards

Honors and Awards, Commissions of Trust

2012 Best Oral Presentation, Fujita Rehabilitation Clinical Research Conference 2014
Award of Presentation, Japan Physical Therapy Conference
2016 Geriatrics and Gerontology International Best Article Award
2016 Best Article Award, Physical Therapy Japan
2017 Excellence Award, Japan Physical Therapy Congress
2018 President's Award, The conference of Japanese Society of physical therapy for prevention
2019 Urakami Award, Annual Meeting of Japan Society for Dementia Prevention
2020 Young Investigator's Award, The Japan Geriatrics Society.
2023 Excellence Poster Presentation, The conference of the Japan Federation of Gerontological Societies

Major Research Interest

My research involves physical and cognitive function among older adults. As PI or co-Investigator on several projects, I conducted studies that had some epidemiological data including cognitive function, gait, blood assays and MRI data in a community setting and prospective data with incident disability and dementia.

Recent Publications (Selected)

1. Doi T, Tsutsumimoto K, Makino K, Nakakubo S, Sakimoto F, Matsuda S, Shimada H. Combined Social Frailty and Life-Space Activities Associated with Risk of Disability: A Prospective Cohort Study. *J Frailty Aging*, 13(2): 184-188, 2024.
2. Doi T, Tsutsumimoto K, Nakakubo S, Kurita S, Ishii H, Shimada H. Associations Between Active Mobility Index and Disability. *J Am Med Dir Assoc*, 23(8): 1335-1341, Aug, 2022.
3. Doi T, Tsutsumimoto K, Ishii H, Nakakubo S, Kurita S, Kiuchi Y, Nishimoto K, Shimada H. Impact of social frailty on the association between driving status and disability in older adults. *Arch Gerontol Geriatr*, 99: 104597, 2022.
4. Doi T, Nakakubo S, Tsutsumimoto K, Kurita S, Ishii H, Shimada H. Spatiotemporal gait characteristics and risk of mortality in community-dwelling older adults. *Maturitas*, 151: 31- 35, 2021.
5. Doi T, Tsutsumimoto K, Ishii H, Nakakubo S, Kurita S, Shimada H. Frailty and driving status associated with disability: a 24-month follow-up longitudinal study. *BMJ Open*, 11(4): e042468, 2021.
6. Doi T, Tsutsumimoto K, Ishii H, Nakakubo S, Kurita S, Shimada H. Association between Sarcopenia, Its Defining Indices, and Driving Cessation in Older Adults. *J Nutr Health Aging*, 25(4): 462-466, 2021.

7. Doi T, Ishii H, Tsutsumimoto K, Nakakubo S, Kurita S, Shimada H. Car Accidents Associated with Physical Frailty and Cognitive Impairment. *Gerontology*, 66(6): 624-630, 2020.
8. Doi T, Nakakubo S, Tsutsumimoto K, Kim M, Kurita S, Ishii H, Shimada H. Spatio-temporal gait variables predicted incident disability. *J Neuroeng Rehabil*, 17(1): 11, 2020.
9. Doi T, Tsutsumimoto K, Nakakubo S, Kim M, Kurita S, Shimada H. Rethinking the Relationship Between Spatiotemporal Gait Variables and Dementia: A Prospective Study. *J Am Med Dir Assoc*, 20(7): 899-903, 2019.
10. Doi T, Tsutsumimoto K, Nakakubo S, Kim M, Kurita S, Hotta R, Shimada H. Physical Performance Predictors of Incident Dementia Among Japanese Community-dwelling Older Adults. *Phys Ther*, 99(9): 1132-1140, 2019.

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Digital Healthcare for Healthy Longevity: Innovations in Predictive Analytics and Community-Centered Care Models

Liang-Kung Chen

Professor and Director, Center for Healthy Longevity and Aging Sciences,
National Yang Ming Chiao Tung University
Superintendent, Taipei Municipal Gan-Dau Hospital
(Managed by Taipei Veterans General Hospital)

Summary

Population aging is a global challenge that affects both developing and developed countries. The World Health Organization (WHO) proposed the concept of "healthy aging", emphasizing the development and maintenance of functional ability in the life course to ensure well-being in older age. On the other hand, the National Academy of Medicine (NAM) of the United States introduced the global roadmap for healthy longevity that defined "healthy longevity" as maintaining physical, mental, and social health and well-being as people live longer.

The global population is aging rapidly, prompting nations worldwide to prioritize "healthy longevity" as a shared objective. While the World Health Organization (WHO) has proposed conceptual frameworks, strategic plans and advocated for integrating digital technology, concrete implementation plans remain insufficiently developed. The integration of big data analytics and artificial intelligence presents unprecedented opportunities to bridge this implementation gap, particularly in developing predictive models for age-related health trajectories and personalized intervention strategies.

In 2017, The Economist made predictions about future healthcare developments. Under the advanced development of precision medicine, information and communication technology (ICT), and artificial intelligence, healthcare systems will undergo major transformation. Through 5G mobile technology, artificial intelligence, and cloud technology, combined with the promotion of home hospitals, innovative care models paired with ICT innovations will construct a new healthcare service ecosystem. This operational model will shift to being community-centered rather than healthcare provider-centered, reshaping the landscape of health and medical services. The emergence of largescale health data platforms enables real-time monitoring of population health trends, facilitating proactive interventions and resource allocation based on predictive analytics.

Facing the global trend of rapid population aging, promoting new strategies for healthy longevity by reducing unhealthy life expectancy has become a key global issue. The innovative development of artificial intelligence provides a precise health platform for early detection of physical and mental functional decline indicators. Through various technological platforms, innovative intervention services can be developed to enhance intervention effectiveness and prevent physical and mental functional decline, ultimately achieving the goal of health and longevity for all people.

Education

1989-1996 M.D. School of Medicine, National Yang-Ming University
2007-2013 Ph.D. Institute of Health Policy and Welfare, National Yang-Ming University

Professional Experiences

2014-present Distinguished Professor, National Yang Ming Chiao Tung University School of Medicine Distinguished Professor
2017-present President, Asian Association for Frailty and Sarcopenia

Honors and Awards

1. 2021 Future Technology Award (Ministry of Science and Technology)
2. 2021 Top 2% Scientist in the World
3. 2022 Ding-Ge Award by 《Harvard Business Review》 Digital Transformation - Service Industry
4. 2022 Top 2% Scientist in the World
5. 2023 Top 2% Scientist in the World
6. 2024 Top 2% Scientist in the World

Major Research Interest

- Geriatric Medicine
- Frailty and Sarcopenia...
- Age-Friendly Health Care
- Dementia Care

Recent Publications (Selected)

1. Weng SE, Lai HY, Chen IT, Kuo MH, Chen LK (corresponding author), Hsiao FY. Diverse diets, resilient aging: A systematic review and meta-analysis on the protective role of dietary diversity against frailty in older adults. *Aging Med Healthc* 2024;15:96-104 [SCI]

2. Chen LK (single author). Integrating precision health with multidomain interventions to advance strategies for healthy aging. *J Nutr Health Aging* 2024;28:100354 [SCI]
3. Hwang AC, Chen LY, Tseng SH, Yen KH, Huang CY, Chen LK, Lin MH, Peng LN. Intrinsic capacity transition predicts overall and cause-specific mortality, incident disability, and healthcare utilization. *J Nutr Health Aging* 2024;28:100359 [SCI]
4. Chen LK (single author). Pulmonary function as a window to cognitive and physical resilience in aging. *Aging Med Healthc* 2024;15:93-95 [SCI]
5. Chen LK (single author). Decoding aging's mosaic for precision healthy longevity. *Nat Aging* 2024;4:1177-1179 [SCI]
6. Hsiao FY, Tan ECH, Lin YC, Chen HM, Guan ST, Tarng DC, Wang CY, Chen LK (corresponding author). Impact of frailty on effectiveness and safety of GLP-1 receptor agonist and SGLT2 inhibitor in people with type 2 diabetes: A nationwide longitudinal study. *Lancet Healthy Longev* 2024;5:100621 [SCI]
7. Cheng HM, Wang JJ, Chuang SY, Lin CH, Mitchell G, Huang CJ, Wang PN, Chung CP, Chen LK, Pan WN, Peng LN, Chen CH. Dissecting the vascular-cognitive nexus: Energetic vs. conventional hemodynamic parameters. *Hypertens Res* 2024;47:2262-2274 [SCI]
8. Meng LC, van Gelder MMHJ, Chuang HM, Chen LK, Hsiao FY, Nordeng HME. Paternal metformin use before pregnancy and risk of congenital malformations: a cross-national cohort study in Norway and Taiwan. *BMJ* 2024;387:e080127 [SCI]
9. Chen LK (single author). From sleep tracking to early Parkinson's disease diagnosis: A promising new frontier. *JMA J* 2024;7:562-563 [SCI]
10. Chung CP, Chen BA, Lee WJ, Liang CK, Lee PL, Peng LN, Chen LK (corresponding author). Sex-dependent interplay of phosphate and inflammation on muscle strength irrespective of muscle mass in older adults. *Exp Gerontol* 2024;197:112613 [SCI]

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From Global Roadmap to Township Implementation

John Eu-Li Wong, MBBS, FAMS, FRCP, FACP

Isabel Chan Professor in Medical Sciences

Executive Director, Centre for Population Health, National University of Singapore

Senior Advisor, National University Health System

Summary

Despite impressive gains in life expectancy, health adjusted life expectancy lags significantly behind in most, if not all countries. With all countries now facing an increasing proportion of older people, it is critical that we strive to keep populations healthy. The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. The United States National Academy of Medicine (NAM) defines healthy longevity as “the state in which years in good health approach the biological life span, with physical, cognitive, and social functioning, enabling well-being across populations.” NAM released its Global Roadmap for Healthy Longevity in 2022, with 5 principles, 8 goals by 2050, and 9 recommendations by 2027. These recommendations include that “Health care and long-term care systems should begin to develop the infrastructure needed to create integrated continua of care supported by interoperable data systems; measure care outcomes based on patient goals and preferences and patient-reported outcomes; and empower citizens with the tools and data needed to manage their own health.”

The National University Health System, Singapore (NUHS) has embraced this with the use of a single electronic medical record (Epic) spanning primary care to general hospitals and tertiary care. Through the use of a single app portal, it links patients with the health system. This allows better chronic disease management and use of analytics for better risk prediction.

NUHS is also a partner, along with the National University of Singapore (NUS) and Singapore’s Housing and Development Board (HDB) in co-chairing a unique whole-of-society, real-world, location-based platform in a southwestern district of Singapore with demographics and socioeconomic profile representative of the country called Queenstown, to develop validated, scalable and sustainable solutions through co-creation with residents and service providers. It has 4 goals: to increase healthy longevity, enable purposeful longevity, promote intergenerational cohesion, and support a community for all ages to enable ageing-in-place. It does this through workstreams addressing preventive health and healthcare delivery into the community; purposeful longevity through community and intergenerational engagement, volunteerism, learning and work; shaping the built environment; use of technology; communications and engagement; and evaluation covering

the domains of wellbeing, productivity and engagement, security, cohesion and equity. It does this through co-design with residents using Ibasho principles, is driven by data and measurable outcomes, and harnesses behavioral and implementation science. The ultimate goal is the creation of a virtuous cycle of healthy longevity, with a publicly declared social compact based on equity and cohesion, investing in enablers such as education and work, social infrastructure, health systems and the physical environment, and addressing disrupters, such as ageism, poverty, the social determinants of health, conflict, pollution, and the effects of global warming. If we are able to do this, we will create healthy and robust populations with increased human, social and economic capital, which can then be reinvested in the enablers and combating disrupters, completing the virtuous cycle.

Education

M.B.B.S. (Bachelor of Medicine, Bachelor of Surgery)	1981
National University of Singapore	
American Board of Internal Medicine	
Diplomate, Internal Medicine	1988
Diplomate, Subspecialty Board of Hematology	1990
Diplomate, Subspecialty Board of Medical Oncology	1991

Professional Experiences

National University of Singapore

Isabel Chan Professor in Medical Sciences	2010 – present
CSI Distinguished Associate Member	2014 – present
Executive Director, Centre for Population Health	2023 – present

National University Health System

Senior Consultant, Department of Hematology-Oncology	1995 – present
Senior Advisor	2020 – present

PREVIOUS APPOINTMENTS

National University Health System

Director, National University Cancer Institute, Singapore (NCIS)	2008 – 2014
Deputy Chief Executive	2008 – 2013
Chief Executive	2014 – 2019

National University of Singapore

Head, Division of Hematology-Oncology, Department of Medicine	1993 – 1995
Director, Office of Life Sciences	2001 – 2006
Vice-President (Research / Life Sciences)	2002 – 2008

Chairman, Board of the NUS Graduate School of Integrative Sciences & Engineering	2003 – 2008
Dean, Yong Loo Lin School of Medicine	2003 – 2011
Vice Provost (Academic Medicine)	2011 – 2013
Senior Vice President (Health Affairs)	2014 – 2019
Senior Vice President (Health Innovation & Translation)	2020 – 2022

National Healthcare Group, Singapore

Director, The Cancer Institute	2001 – 2008
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National University Hospital, Singapore

Consultant	1992 – 1995
Chief, Department of Medical Oncology	1994 – 2000
Chairman, Medical Board	2000 – 2002

Health Sciences Authority

Board Chairman, Ministry of Health	2012 – 2013
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Taipei Medical University 2010 – 2013

Honorary Visiting Professor	
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Honors and Awards

Special Letter of Commendation, Singapore Armed Forces	1983
Fellow, Academy of Medicine, Singapore	1996
Fellow, Royal College of Physicians, Edinburgh	1999
Fellow, Royal College of Physicians, London	2005
Fellow, American College of Physicians	2008
Public Administration Medal (Silver), Singapore National Day Awards	2005
National Outstanding Clinician Award, 2009 National Medical Excellence Awards	2009
Ministry of Health	
Sass Foundation Award	2010
Sass Foundation for Medical Research, in conjunction with MD Anderson Cancer Center	
Singapore Medical Association (SMA) Lecture 2010	2010
Friend of MedSoc Award 2011	2011
NUS Medical Society	
Outstanding Service Award, National University of Singapore	2013
President's Science & Technology Medal, President's Science & Technology Awards,	2014

Republic of Singapore	
Long Service Medal, Singapore National Day Awards	2015
Public Administration Medal (Gold), Singapore National Day Awards	2016
International Member, The United States of America National Academy of Medicine	2019
Beth Israel Deaconess Medical Center, Harvard Medical School	2019
KL Chopra Visiting Lectureship in Medicine and Humanities	
Degree of Doctor Philosophiae Honoris Causa	2019
The Hebrew University of Jerusalem	
Medal of Commendation, Singapore May Day Awards	2020
National University Health System Award	2022
Member, Academia Europaea	2022
David Rall Medal 2023, National Academy of Medicine	2023
National University Health System Emeritus Consultant	2023

INTERNATIONAL COMMITTEES (CURRENT)

M8 Alliance of Academic Health Centers, Universities and National Academies World Health Summit	2011 – present
Member	
Association of Academic Health Centers International	2012 – present
Member, Steering Committee	
Global Genomic Medicine Collaboration (G2MC)	2014 – present
Member, Steering Committee	
The United States of America National Academy of Medicine Commission	2019 – present
Co-Chair, Creating a Global Roadmap for Healthy Longevity	
Advisory Committee for Minding Our Future: Healthy Aging, Food & Lifestyle	2021 – present
A joint effort of Harvard T.H. Chan School of Public Health, The Culinary Institute of America, and Association Montessori Internationale	
Member	
Lancet Commission on 21st Century Global Health Threats	2023 – present
Commissioner	
Steering Committee, Nikkei Forum, Super Active Ageing Society Conference	2024 – present
Member	
Technical Expert Panel, Agency for Healthcare Research and Quality (AHRQ), United States Department of Health and Human Services	2024 – present

Member

**INTERNATIONAL BOARDS OF DIRECTORS / ADVISORY BOARDS
(CURRENT)**

Hamad Medical Corporation, Government of Qatar 2011 – present

Member of the International Advisory Board, Academic Health System

Harvard T.H. Chan School of Public Health 2015 – present

USA NIH Director's Pioneer Award Stakeholders' Advisory Board

Major Research Interest

- Population Health
- Academic Health Systems
- Value Based Care
- Cancer Drug Development

Recent Publications

1. Allen, D. M., Kiyota, E., Wong, J. E. L., on behalf of the Health District @ Queenstown. 2024. Health District at Queenstown: Catalyst for translational research. *Annals, Academy of Medicine, Singapore*, 2024;53:264-7. <https://doi.org/10.47102/annals-acadmedsg.2023369>.
2. Friese, C. R., J. E.L. Wong, E. N.K. Ang, C. S. L. Koh, and S. K. Inouye. 2023. Re-Centering Nursing Care to Meet the Needs of Patients and Families: A Call for Executive Action. *NAM Perspectives. Commentary, National Academy of Medicine, Washington, DC*. <https://doi.org/10.31478/202307a>.
3. Fried, L.P., Wong, J.E.L. & Dzau, V. A global roadmap to seize the opportunities of healthy longevity. *Nat Aging*, December 2022. <https://doi.org/10.1038/s43587-022-00332-7>
4. John E.L. Wong, Linda P. Fried, Victor J. Dzau, The Global Roadmap for Healthy Longevity: United States of America National Academy of Medicine Consensus Study Report, 2022, *The Journal of the Economics of Ageing*, Volume 24, 2023, 100421, ISSN 2212-828X, <https://doi.org/10.1016/j.jeoa.2022.100421>.
5. National Academy of Medicine. 2022. *Global Roadmap for Healthy Longevity*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26144>.
6. Singapore's health-care system: key features, challenges, and shifts. Chorh Chuan Tan, Carolyn S. P. Lam, David B. Matchar, Yoong Kang Zee, John E. L. Wong. *The Lancet*, September 2021: doi: 10.1016/S0140-6736(21)00252-X.

7. Capturing acquired wisdom, enabling healthful aging, and building multinational partnerships through senior global health mentorship. C. Norman Coleman, John E. Wong, Eugenia Wendling, Mary Gospodarowicz, Donna O'Brien, Taofeeq Abdallah Ige, Simeon Chinedu Aruah, David A. Pistenmaa, Ugo Amaldi, Onyi-Onyinye Balogun, Harmar D. Brereton, Silvia Formenti, Kristen Schroeder, Nelson Chao, Surbhi Grover, Stephen M. Hahn, James Metz, Lawrence Roth, Manjit Dosanjha. *Glob Health Sci Pract*, October 2020. 8(4): 626-637: doi.org/10.9745/7GHSP-D-20-00108.
8. COVID-19 in Singapore – Current Experience: Critical Global Issues That Require Attention and Action. John E. L. Wong, Yee Sin Leo, Chorh Chuan Tan. *JAMA*, February 2020: doi:10.1001/jama.2020.2467.

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Teresa Wong <teresa@nus.edu.sg>

4. 総括

第19回国際シンポジウムはオンサイトと Youtube Live 配信のハイブリッドで行い、会場参加者は104名、Youtube Live 配信視聴者は日本語配信364名、英語配信64名 総合計は532名であり、過去の開催と比較し、より多くの方にご参加いただき、デジタルヘルスケアに対する多くの関心があることが伺えた。

セッションⅠでは「日本のヘルスケア政策」について、産業政策的観点からの健康増進に資する施策を経済産業省ヘルスケア産業課 橋本泰輔課長に、当センターも参加しているあいちデジタルヘルスプロジェクトの取り組みについて、愛知県経済産業局 柴山政明顧問にご紹介いただいた。健康寿命の延伸と生活の質の維持・向上は産官学連携が必要不可欠であり、今後も連携を図りながら、貢献していきたい。

セッションⅡではセッション名を「ICT ドリブンの健康長寿社会」と称して、Google の慈善事業部門である Google.org の支援を受け、長寿科学振興財団が研究助成する、高齢者のデジタルデバイド解消プロジェクトの中間報告会をいただいた。急速に進む高齢化と社会のデジタル化に伴い、デジタルソリューションの恩恵を受けられる層と受けられない層の情報格差は問題視されている。特に高齢者のデジタルデバイドは、長年にわたり議論されてきた課題である。このような課題を解決するための、本プロジェクトは、高齢者の社会参加や生活の質を向上させるための社会的な重要な研究であり、今後の研究の更なる進展と展開が期待された。

ランチョンセミナーでは、京都大学医学部附属病院 黒田 知宏先生に医療ビッグデータの収集と活用の方法を実践的にご講義いただいた。医療ビッグデータは、医療 AI を始めとしたデジタルヘルス技術の開発や疫学研究に不可欠であるが、現場の医療従事者や患者からの反発は多い現状である。ご講義いただいた手法を各機関が実践することで、今後更なる医療ビッグデータの収集を利活用が進められるよう期待したい。

セッションⅢでは、デジタルヘルスケアとビッグデータに関する社会制度と臨床・福祉・介護への展開を、諸外国での事例を中心にご紹介いただいた。

Jarmo Reponen 先生からご紹介いただいたフィンランドの全国的な医療情報交換・データリポジトリシステム「KANTA」や日本の科学的介護情報システム「LIFE」、ビッグデータ解析と AI を活用した臨床・予防への展開、シンガポールにおけるプライマリーケアから3次医療まで、単一の電子カルテシステムを用いた慢性疾患管理とリスク予測のため仕組みなど、デジタルヘルスケアとビッグデータの統合、社会システムへの展開など、各国の先進的な取り組みが活発に議論された。

セッションⅣでは、ウェアラブルデバイスで収集した生活ログデータを用い

たフレイルの判別や、仮想空間や触覚デバイスを用いた主観的な健康感の指標を探索する研究、アプリケーションを用いたパーソナライズされた転倒予防プログラムの研究などがご報告された。デジタルソリューションの発展により従来の老年学研究が拡張され、予防医療の充実、健康寿命延伸に繋がることに期待したい。

基調講演では、内閣府「戦略的イノベーション創造プログラム」で統合型ヘルスケアの事業のプログラムディレクターをされている自治医科大学学長 永井良三先生に、健康寿命を延伸するために、我々がどのようにデジタル技術を活用するか、統合型ヘルスケアの事業にて日本が今後目指す医療提供についてご講演いただいた。ビッグデータと医療 AI の発達により、生活習慣病や高齢者の治療やケアが大きく変化しつつある中、AI を使う我々もデータ科学に通じる必要があり、医療者は若い世代を教育する務めがあるが、これからはその仲間に AI が含まれるようになり、我々にとって AI の教育も重要な時代になったことを考えなければならない。

以上のように、第 19 回国際シンポジウムでは、世界の老年医学の研究者、デジタルヘルス、医療ビッグデータの研究者との交流が可能となり、NCGG の研究・臨床活動の活性化に貢献することができた。

さいごに、公益財団法人長寿科学振興財団（The Japan Foundation for Aging and Health）様のご共催、Google 合同会社様の多大なるご支援をいただき、多くの企業、団体のご後援、また、センター内外からのご発表者、ご参加の皆様へ深く御礼申し上げます。

（国立長寿医療研究センター研究所長 櫻井 孝）



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