# Preventive impact of social participation on the onset of non-communicable diseases among middle-aged adults

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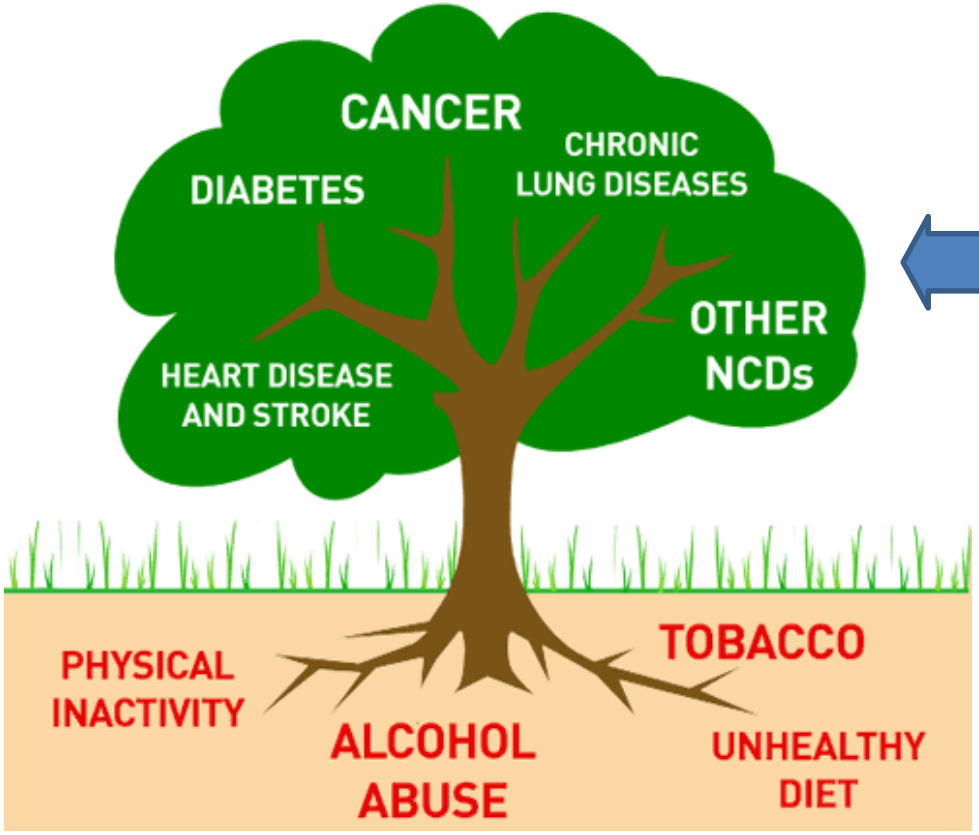
# Non-communicable diseases (NCDs)




**Social participation (SP)**

## Motivation

- **Social participation (SP)** is known to have a favorable impact on the health of ***older adults*** by reducing the risk of functional disability, psychological distress, cognitive impairment, and mortality…

- …but the preventive impact of SP on **non-communicable diseases (NCDs)** among ***middle-aged adults*** is largely understudied.

## Research purpose

Hence,

- we estimated **Cox proportional hazards** models to estimate the preventive impact of SP adjusted for baseline covariates…

- … using the dataset from a population-based, 10-wave longitudinal survey that started with Japanese adults aged 50–59 years in 2005 (16,290 men and 17,248 women).

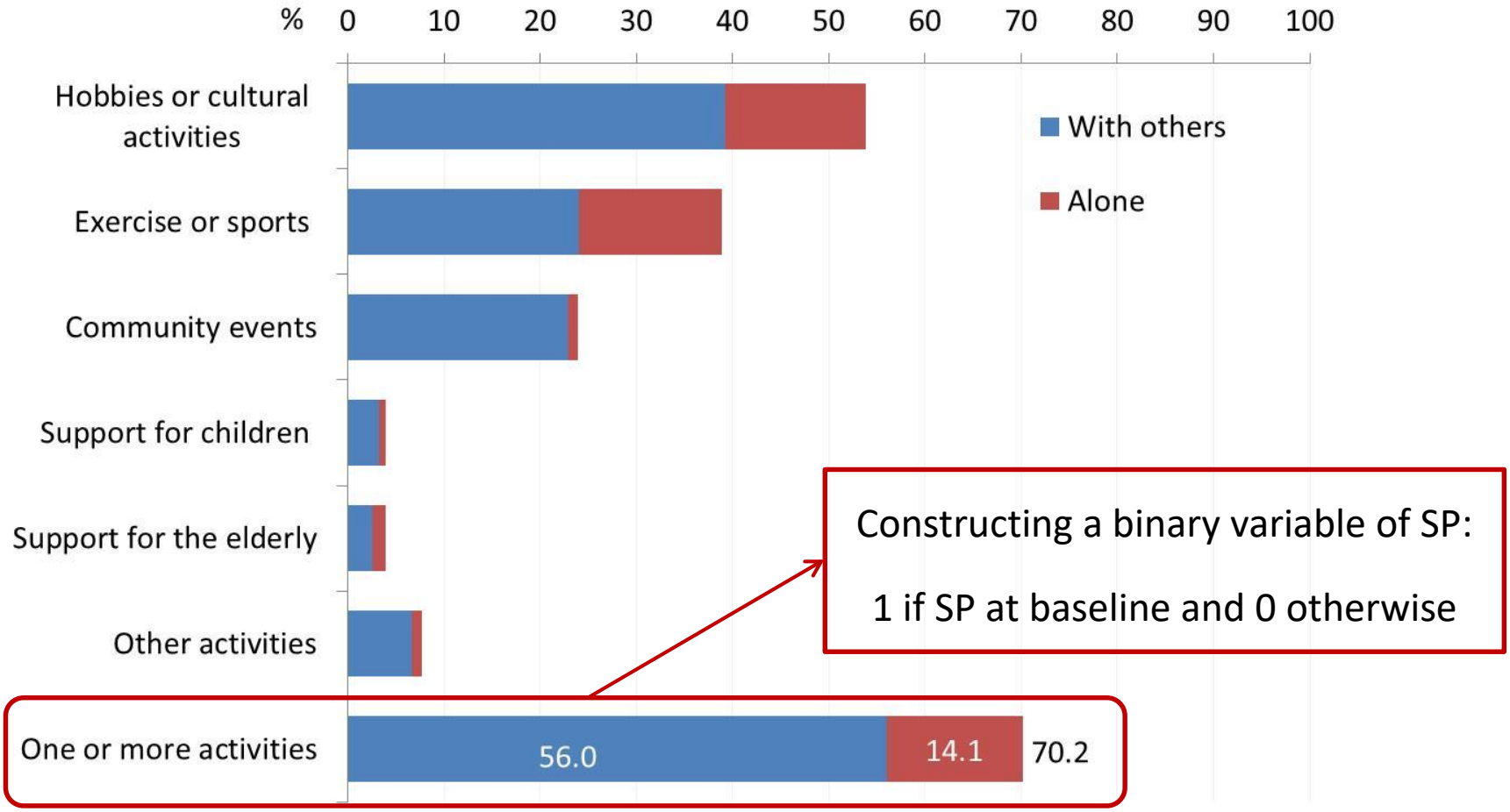
## Study sample

*Longitudinal Survey of Middle-aged and Older Adults*

- Nationwide, genuine panel data
- Ministry of Health, Labour and Welfare (MHLW)
- Conducted every year since 2005
- Data of 10 waves (2005-2014) used in this study
- Started with 34,240 individuals aged 50-59 (10 cohorts)

To capture the preventive impact of SP on health, we focused only on the respondents who did not report its incidence at baseline.

# Six types of SP activities and their prevalence at baseline



**Six types of NCDs**

- diagnosed with each by a medical doctor at the survey time:

> 1) diabetes, 2) heart disease, 3) stroke, 4) hypertension,
> 5) hyperlipidemia, and 6) cancer.

**Covariates**

- Time-invariant individual attributes:
  gender and educational attainment
- Baseline variables:
  age, household spending, current smoking,
  heavy alcohol consumption, and self-rated health

## Analytic strategy

### *1) Descriptive analysis*

- Concentrated on respondents who participated in all ten waves
- Compared the probabilities of onset for each NCD between those with at least one SP at baseline and those without it.
- Ignored the potential attrition bias

***2) Regression analysis***

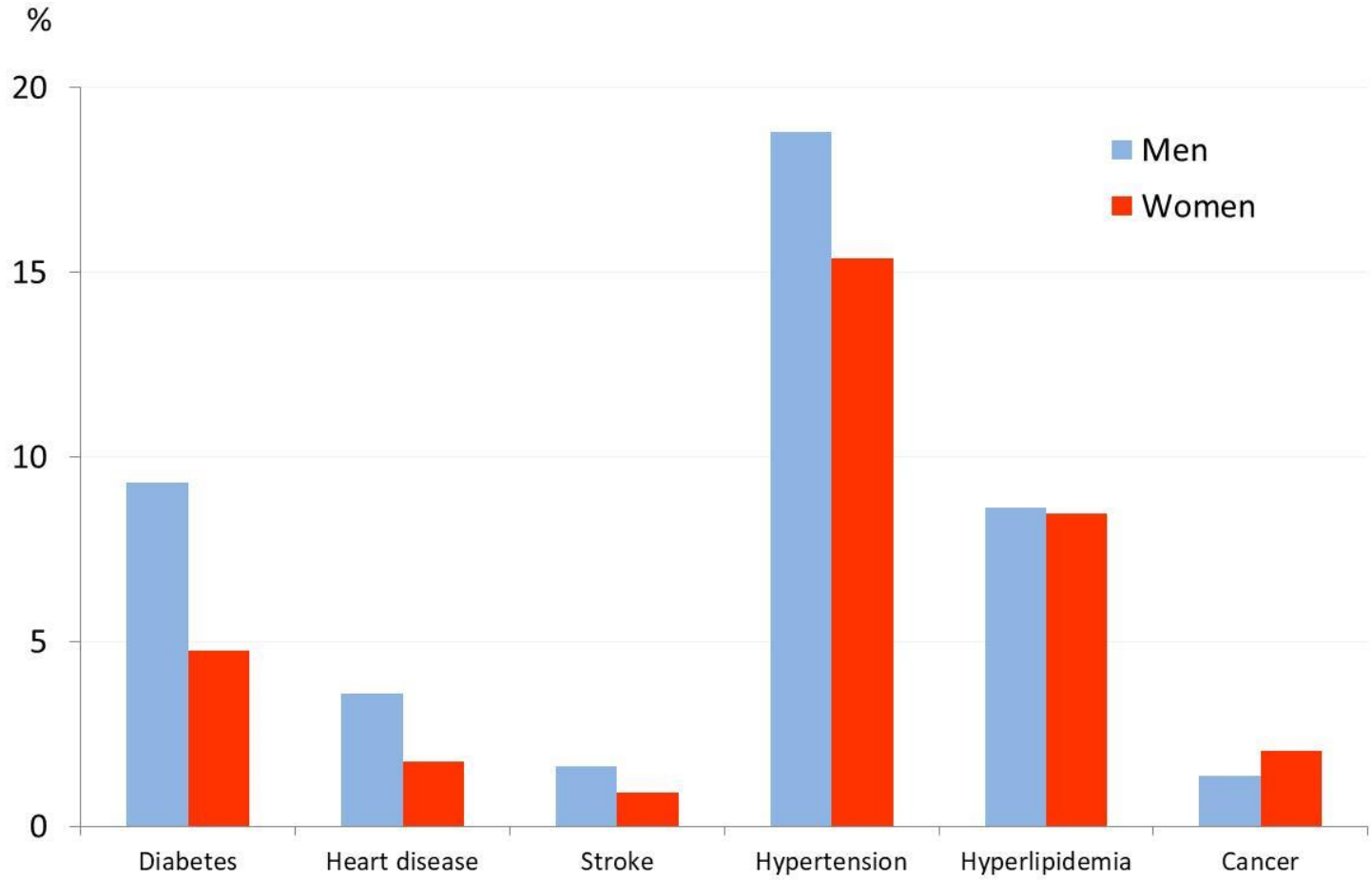
Estimated three Cox proportional hazards models to compute the HR for each NCD over 9 follow-up waves for men and women.

- **Model 1** estimated the crude HR for each health outcome for the SP group, unadjusted for covariates.

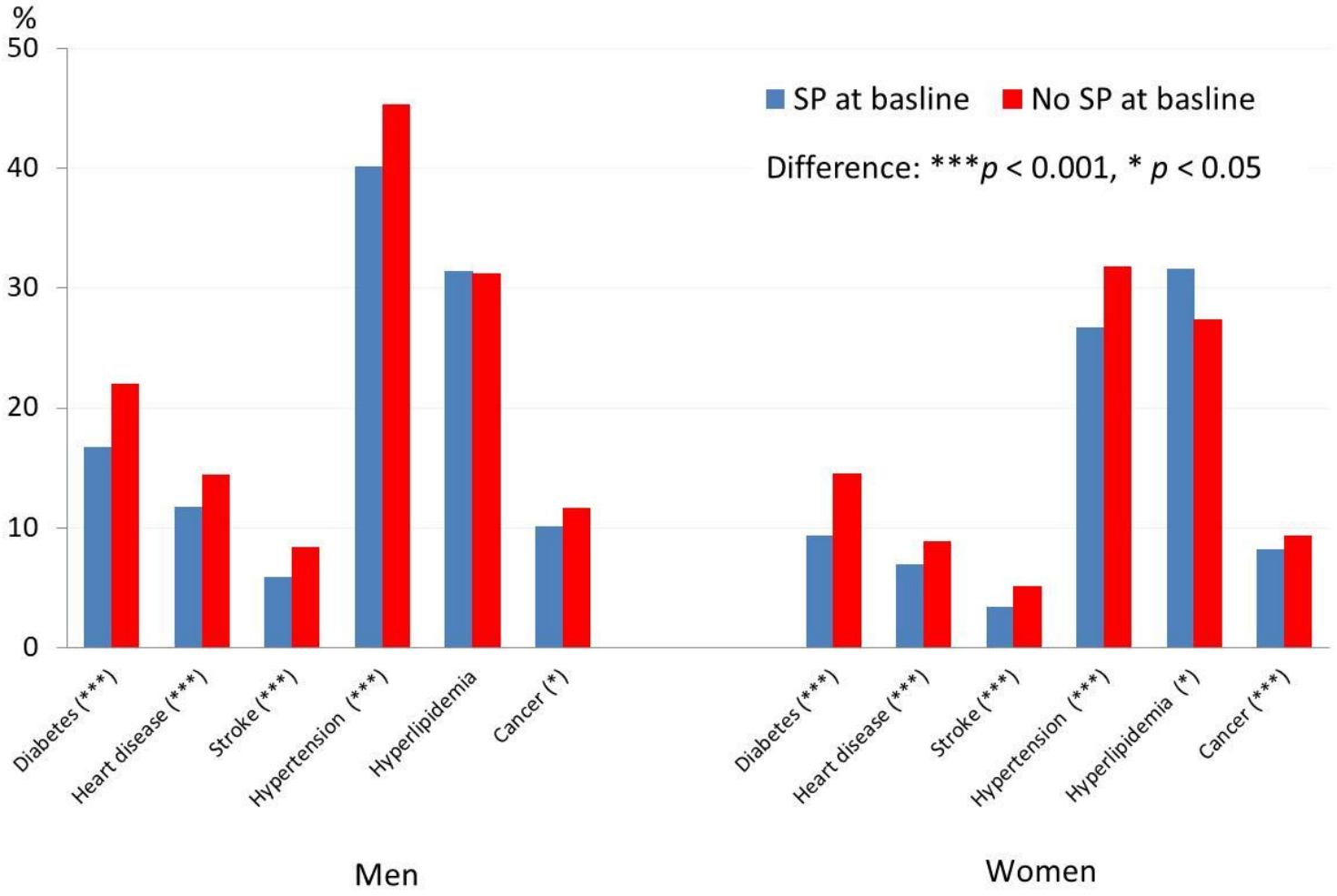
- **Model 2** estimated the HR for each health outcome for the SP group, adjusted for covariates

- **Model 3** replaced SP with the variable for the type of SP — “SP with others” or “SP alone”—in Model 2.

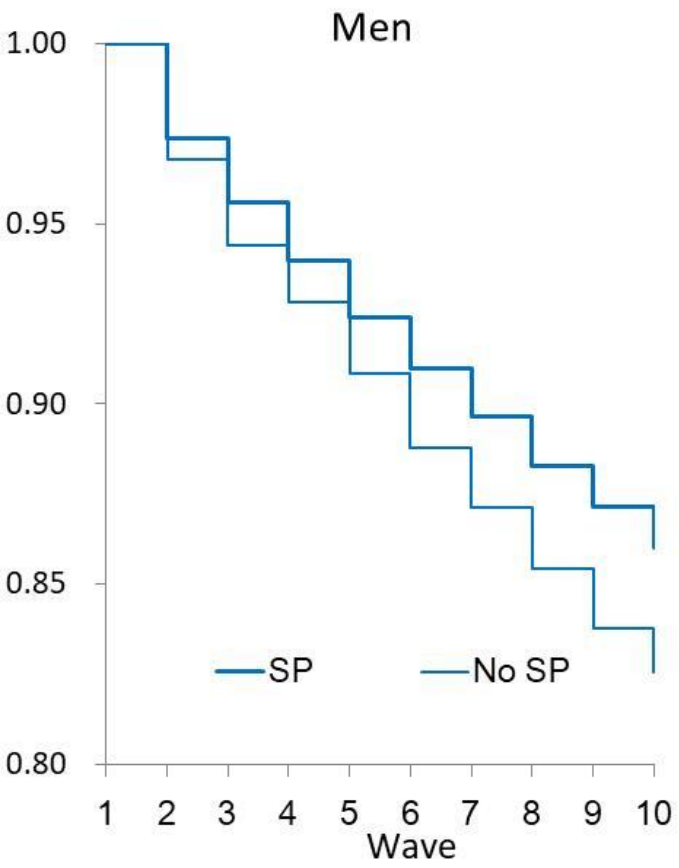
# RESULTS Prevalence of NCDs at baseline

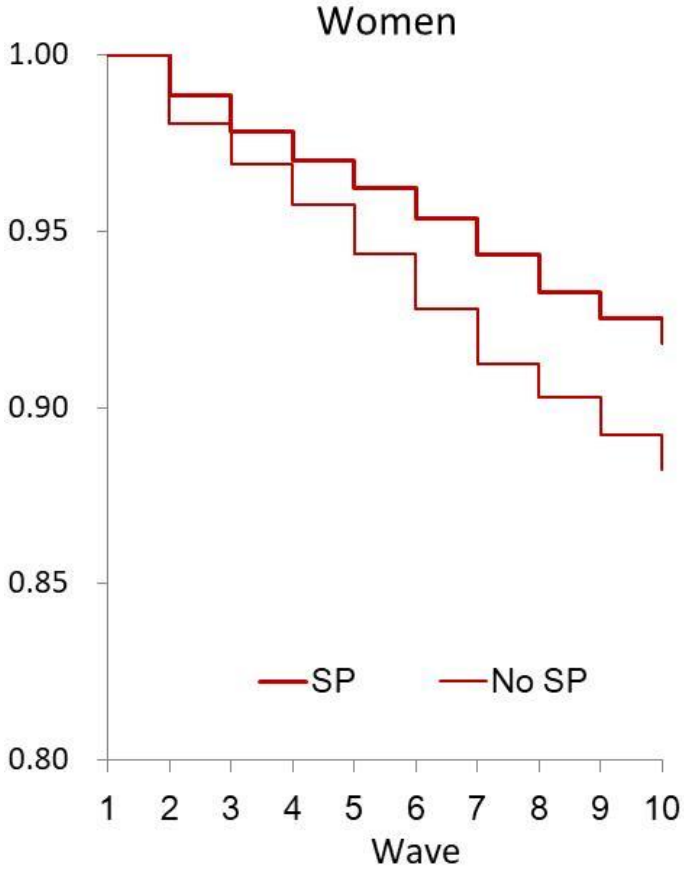


# Proportions of the onset of NCDs by Wave 10



# Diabetes: Kaplan-Meier survival (= no onset) estimates between individuals with and without baseline SP



## Results of Models 1 and 2 for men

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Controlled for covariates | No | | Yes | |
| | HR | 95% CI | HR | 95% CI |
| **Diabetes** | **0.79** | **(0.72, 0.88)** | **0.86** | **(0.77, 0.95)** |
| Heart disease | 0.87 | (0.77, 0.99) | 0.93 | (0.82, 1.05) |
| **Stroke** | **0.75** | **(0.64, 0.89)** | **0.83** | **(0.70, 0.99)** |
| Hypertension | 0.94 | (0.87, 1.00) | 0.95 | (0.88, 1.02) |
| Hyperlipidemia | 1.14 | (1.05, 1.23) | 1.07 | (0.98, 1.16) |
| Cancer | 0.93 | (0.81, 1.06) | 0.96 | (0.84, 1.10) |

## Results of Models 1 and 2 for women

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Controlled for covariates | No | | Yes | |
| | HR | 95% CI | HR | 95% CI |
| **Diabetes** | **0.68** | **(0.60, 0.76)** | **0.75** | **(0.66, 0.85)** |
| Heart disease | 0.85 | (0.73, 0.99) | 0.92 | (0.79, 1.07) |
| **Stroke** | **0.70** | **(0.58, 0.86)** | **0.78** | **(0.64, 0.97)** |
| **Hypertension** | **0.88** | **(0.81, 0.95)** | **0.91** | **(0.84, 0.99)** |
| *Hyperlipidemia* | *1.30* | *(1.20, 1.41)* | *1.27* | *(1.17, 1.38)* |
| Cancer | 0.94 | (0.81, 1.08) | 0.96 | (0.83, 1.11) |

## Results of Model 3 for men and women

| | | Men | | Women | |
|---|---|---|---|---|---|
| | | HR | 95% CI | HR | 95% CI |
| Diabetes | **With others** | **0.87** | **(0.78, 0.97)** | **0.73** | **(0.64, 0.83)** |
| | Alone | 0.81 | (0.70, 0.94) | 0.85 | (0.71, 1.03) |
| Stroke | **With others** | **0.79** | **(0.66, 0.94)** | **0.77** | **(0.62, 0.95)** |
| | Alone | 0.99 | (0.78, 1.25) | 0.87 | (0.63, 1.19) |
| Hypertension | **With others** | 0.96 | (0.84, 1.04) | **0.91** | **(0.83, 0.99)** |
| | Alone | 0.93 | (0.85, 1.04) | 0.94 | (0.83, 1.06) |

## DISCUSSION and CONCLUSIONS

SP prevented some but not all types of NCDs.

- **Diabetes** and **stroke** were most effectively prevented in both genders.
- SP had a modest preventive effect on **hypertension** only for women but no effect on **heart disease**.
- **Cancer** was not associated with SP, and HR for **hyperlipidemia** was positively associated with SP among women.

**Why diabetes, stroke, and hypertension?**

- Preceding studies have found that these types of NCDs have close associations with **psychological distress** (Henderson et al., 2013; Nabi et al., 2011; Pan et al., 2011; Rotella & Mannucci, 2013), suggesting that the preventive impact of SP on them may be mediated by psychological distress.

**Why raising the risk of hyperlipidemia?**

- ? (dining out)

## Policy implications

- Results imply that policy measures to encourage SP are favorable for the health of middle-aged adults.

- To enhance the effectiveness of interventions to enhance SP among adults, we have to encourage personal interactions with other individuals and to avoid social isolation.

# Thank you for your attention!

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Preventive impact of social participation on the onset of non-communicable diseases among middle-aged adults: A 10-wave hazards-model analysis in Japan

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