

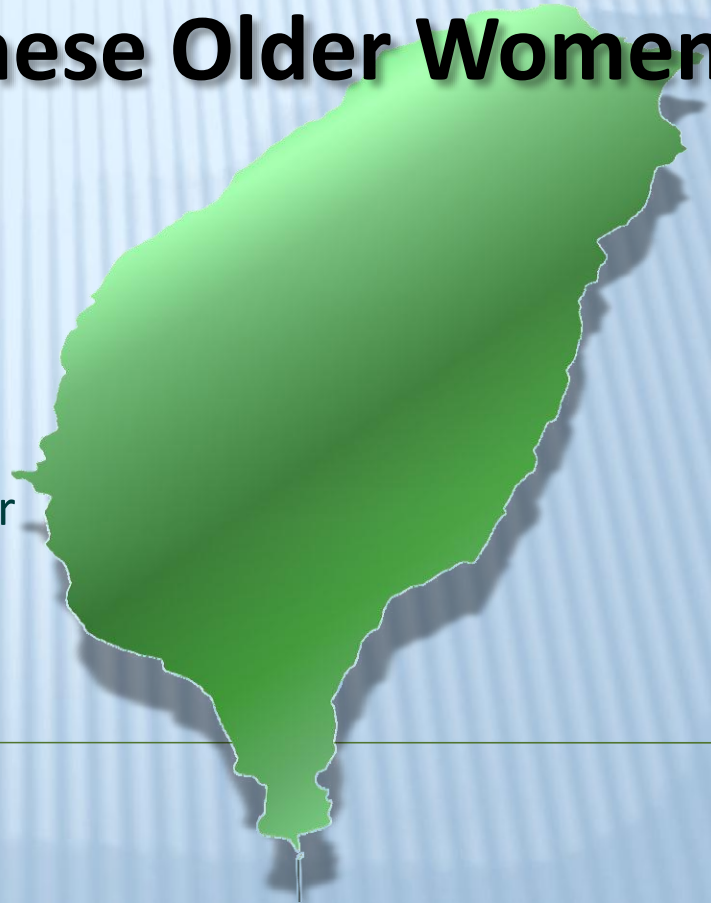
# Keep On Walking: Correlations among Life Styles and Successful Aging in Taiwanese Older Women

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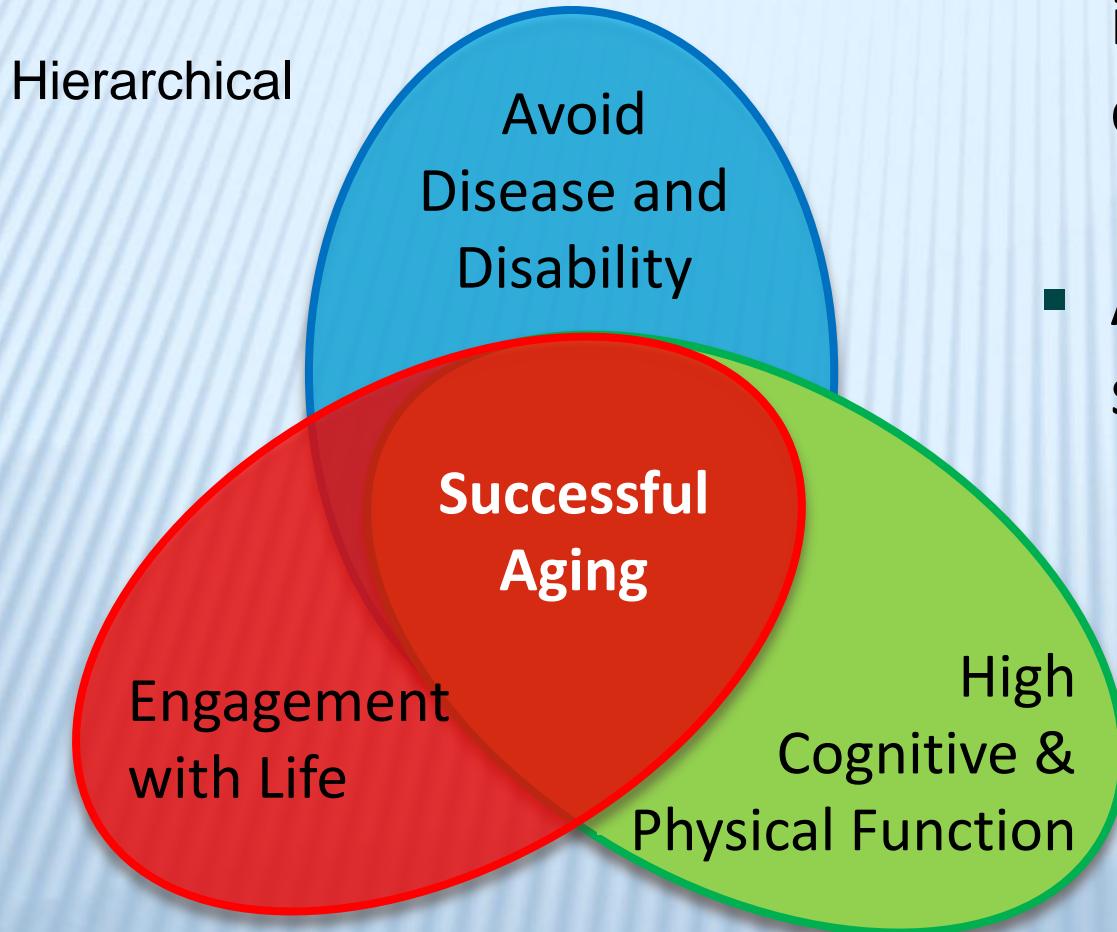


# BACKGROUND

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# Successful Aging

- Rowe & Kahn (1987, 1997, 1998)



- Too narrow, didn't include the dynamic of the life process  
~e.g. Schiedt et al., 1999
- A “calculable gold standard of aging”  
~Dillaway & Byrnes, 2009

# Operational Definition

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- Two studies using the HRS and SHARE data operationally defined successful aging as fitting all following 5 criteria:
  1. No Major Disease
  2. No Disability
  3. High Physical Functioning
  4. High Cognitive Functioning
  5. Active Social Engagement

HRS : McLaughlin, et al., 2010

SHARE : Hank, 2010



# Results From Previous Study

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- Wu, Lin, & Hurng (2011):
  - + Following the operational definition by McLaughlin et al(2010) and Hank (2010)
  - + Using the data from 2 waves of National Health Interview Survey(NHIS) in Taiwan
    - 2005 NHIS: n = 2,432
    - 2009 NHIS: n = 2,617

# Percentages of Taiwanese Older Adults Meeting Each Individual Successful Aging Criterion by Year and Compared to Other Country

	Taiwan		USA	Europe	Denmark	Poland	Sweden	German
	2005	2009						
Criterion	%(n)	%(n)	%	%	%	%	%	%
Successful Aging	17.3 (398)	18.2 (425)	10.9	8.5	21.1	1.6	17.4	11.6
No Major Disease	52.1 (1244)	56.3 (1438)	37.0	42.6	51.0	25.5	45.2	47.5
No Disability	90.9 (2207)	88.1 (2305)	82.1	83.7	85.9	67.0	86.8	84.2
High Physical Functioning	65.3 (1575)	68.2 (1714)	49.0	57.3	69.4	31.1	69.4	61.4
High Cognitive Functioning	56.7 (1326)	56.4 (1347)	57.8	48.5	67.2	30.5	63.4	67.5
Active Engagement	54.5 (1314)	49.2 (1266)	49.7	27.1	42.6	17.1	39.7	27.4

# Prevalence Of Successful Aging by Demographic and Year

Characteristic	2005		2009	
	n	%	n	%
<b>Age, years</b>				
65-74	307	21.5	352	25.1
75-84	86	11.2	69	8.3
≥ 85	5	4.7	4	4.1
<b>Gender</b>				
Male	275	23.6	255	23.0
Female	123	10.6	170	13.7
<b>Education</b>				
Elementary school or lesser	265	14.7	255	14.7
Junior High	51	25.3	57	25.3
Senior High	41	29.1	61	28.4
College or higher	41	24.3	52	26.4
<b>Marital Status</b>				
Married	315	20.9	345	22.0
Divorced/Separated	6	17.4	6	16.3
Widowed	71	9.7	73	11.0
Never Married	6	9.8	1	0.0
<b>Household Income (per month)</b>				
< 30,000 N.T.	202	16.4	147	12.4
30,000~70,000 N.T.	122	19.9	93	21.7
> 70,000 N.T.	51	21.1	54	33.0

# Female Disadvantage ?

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- Women were found advantage while considering successful aging
  - USA: Strawbridge et al (2002)
  - Singapore: Ng et al. (2009)
- Women lives longer than man
  - But not healthier ?????



# Adjusted ORs for Successful Aging by Demographic Criteria

Variables		2005			2009		
		OR	<i>p</i>	(95%CI)	OR	<i>p</i>	(95%CI)
<b>Age, years (ref 65-74)</b>							
	≥ 75	0.38	.000	(0.29, 0.50)	0.23	.000	(0.18, 0.31)
<b>Sex (ref male)</b>							
	Female	0.35	.000	(0.26, 0.46)	0.42	.000	(0.31, 0.55)
<b>Education (ref elementary)</b>							
	Junior High	1.67	.020	(1.08, 2.57)	1.54	.039	(1.02, 2.31)
	Senior High	1.51	.094	(0.93, 2.45)	1.53	.038	(1.02, 2.27)
	College or higher	1.27	.276	(0.83, 1.93)	1.39	.136	(0.90, 2.13)
<b>Sex X Education</b>			<b>.042</b>			<b>.001</b>	
<b>By Sex (ref elementary)</b>							
Male	Junior High	1.65	.022	(1.08, 2.54)	1.52	.043	(1.01, 2.29)
	Senior High	1.51	.095	(0.93, 1.84)	1.52	.038	(1.02, 2.27)
	College or higher	1.26	.289	(0.82, 1.92)	1.36	.195	(0.89, 2.09)
Female	Junior High	1.81	.125	(0.85, 3.87)	2.84	.000	(1.65, 4.88)
	Senior High	4.77	.000	(2.21, 10.28)	3.08	.000	(2.91, 6.71)
	College or higher	3.29	.016	(1.25, 8.63)	5.18	.000	(2.89, 9.28)
<b>By Education (ref male)</b>							
Elementary	Female	0.35	.000	(0.26, 0.46)	0.42	.000	(0.32, 0.55)
Junior High	Female	0.36	.016	(0.16, 0.83)	0.73	.316	(0.39, 1.36)
Senior High	Female	1.00	.998	(0.43, 2.31)	0.82	.553	(0.42, 1.58)
College or higher	Female	0.86	.769	(0.31, 2.37)	1.45	.297	(0.72, 2.92)

# Aim of the Study

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- To explore the correlations among health behaviors and successful aging in Taiwanese older women
  1. Taiwanese older women were less successful aged than men did, and education might be part of the reason
  2. Education Level → Life Styles  
Life Styles → Successful Aging

# METHOD

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# PARTICIPANTS

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- 2009 National Health Interview Survey(NHIS)
  - + Female
  - + Age  $\geq 65$
  - + N = 1,474



# Definition of Successful Aging

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- **No Major Disease (Disease=0)**
  - + Cancer
  - + Chronic Lung Disease
  - + DM
  - + Heart Disease
  - + Stroke
  - + Depression (CESD $\geq$ 10)

# Definition of Successful Aging

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- **No Disability (ADL=0)**
  - + Bathing
  - + Dressing
  - + Toileting
  - + Walking Across a Room
  - + In/Out Bed
  - + Eating
- **High Cognitive Functioning (MMSE)**  
**(Score  $\geq$  Median 24)**

# Definition of Successful Aging

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- **High Physical Functioning**

- (Functional Problems  $\leq 1$ )**

- + Stooping, kneeling, crouching
- + Walking from room to room
- + Climbing one flight of stairs
- + Walking 400m
- + Finger grasping
- + Lifting items >4.5kg with one hand
- + Raising both arms overhead
- + Holding and turn keys to unlock



# Definition of Successful Aging

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- **Active Social Engagement (Fit both Criteria A+B)**
- **Active Engagement Criteria A (At least 1)**
  - + Paid work
  - + Volunteer work
  - + Caring children
- **Active Engagement Criteria B (At least 1)**
  - + Married
  - + Connected with friend
  - + Connected with neighbors



# Independent Variables

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- Age & Education
- Health Behaviors

- Drinking

How often did you drink in the past year?

- Smoking

Have you ever smoked for over 100 cigarettes ?

- Betel Chewing

Have you ever chewed betel nuts ?

- Exercise

Did you exercise in past 2 wks? How many times?

- Walking

Besides exercise and physical labor, did you walk continuously for at least 10minutes in past 2 wks? How many times?

- Physical Labor

Did you do any physical laboring works in past 2 wks? How many times?

# Analysis

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- Descriptive Statistics
- Simple Logistic Regression
- Multivariate Logistic Regression

# RESULTS

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# Prevalence and Unadjusted ORs of Successful Aging by Demographic and Health Behavior

		Total	Successful Aging			
		n	n	%	OR	95% CI
<b>Age</b>	65-74	909	153	19.3	1	
	$\geq 75$	565	17	4.1	0.23	(0.14, 0.38)
<b>Education</b>	Elementary	1258	116	10.3	1	
	High School	160	39	25.2	2.61	(1.68, 4.05)
	College	42	15	41.9	3.33	(1.78, 6.23)
<b>Drinking</b>	Never	39	3	6.9	1	
	$\leq 1$ time /wk	1315	138	11.9	2.04	(1.25, 3.32)
	$> 1$ time /wk	120	29	32.0	0.60	(0.15, 2.49)
<b>Smoking</b>	Non-Smoker	1417	168	14.0	1	
	Smoker	57	2	2.3	0.31	(0.04, 2.57)
<b>Betel</b>	Non-chewer	1428	169	13.9	1	
	Chewer	46	1	1.2	0.13	(0.00, 6.67)



# Prevalence and Unadjusted ORs of Successful Aging by Demographic and Health Behavior

	Total	Successful Aging			
	n	n	%	OR	95% CI
<b>Physical Labor</b>					
No	1202	128	13.2	1	
Yes	250	41	16.8	1.26	(0.81, 1.97)
<b>Exercise</b>					
No	743	52	7.0	1	
1-6 times/ per 2 wks	103	19	18.4	3.04	(1.32, 5.38)
≥ 7 times/ per 2 wks	603	98	16.3	2.61	(1.83, 3.71)
<b>Walking</b>					
No	767	65	8.8	1	
1-6 times/ per 2 wks	186	24	13.8	1.60	(0.97, 2.63)
≥ 7 times/ per 2 wks	489	78	20.0	2.05	(1.44, 2.91)

# Exercise + Walking

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- Exercise

- Did you exercise continuously for at least 10minutes in the past 2 wks?
- How many times?

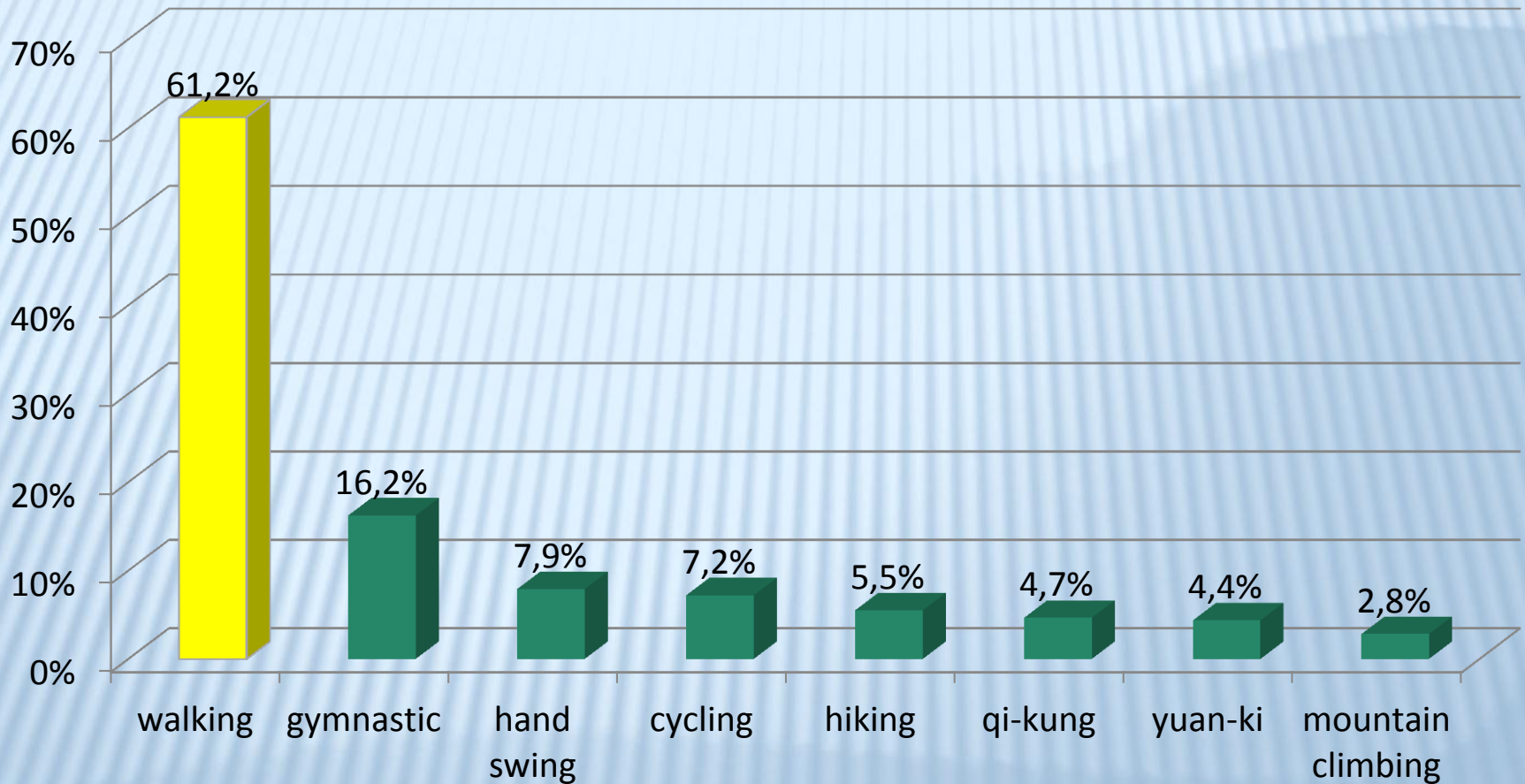
- Walking

- Besides exercise and physical labor, did you walk continuously for at least 10minutes in past 2 wks?
- How many times?

# Adjusted ORs of Successful Aging

		All (n= 1,425)			Didn't Exercise (n = 743)		
		ORs	95%CI		ORs	95%CI	
<b>Age</b>	65-74	1			1		
	≥75	0.19	0.11	0.33	0.14	0.06	0.37
<b>Education</b>	Elementary				1		
	High School	2.75	1.78	4.26	1.27	0.45	3.59
	College	3.38	1.65	6.94	5.09	0.84	30.96
<b>Drinking</b>	Never						
	≤ 1 time /wk	2.46	0.67	9.08	NA		
	> 1 time /wk	1.48	0.43	5.07	NA		
<b>Physical labor</b>	No	1			1		
	Yes	1.47	0.98	2.21	1.64	0.84	3.21
<b>Exercise</b>	No	1					
	1-6 times/ per 2 wks	1.89	1.03	3.48			
	≥ 7 times/ per 2 wks	1.92	1.32	2.78			
<b>Walking</b>	No				1		
	1-6 times/ per 2 wks				0.46	0.13	1.65
	≥ 7 times/ per 2 wks				2.03	1.09	3.76

# Type of Exercise





# Results: Summary

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## Simple Logistic Regression

- Exercise (Yes vs. No)
- Walking (More than 7days in 2wks vs. No)
- Drinking (Less than once a week vs. Never)

Has higher probability of being successful aged

# Results: Summary

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## Multivariate Logistic Regression

- Exercise
  - + About 1.9 times higher in probability of aging successfully for those who exercises than those who didn't
  - + Most older women's exercise were walking (61%)
- Walking
  - + Those who didn't exercise
  - + Walks continuously  $\geq 10$  minutes,  $\geq 7$  days in 2wks
  - + About 2 time higher in probability of aging successfully

# DISCUSSION

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# Discussion

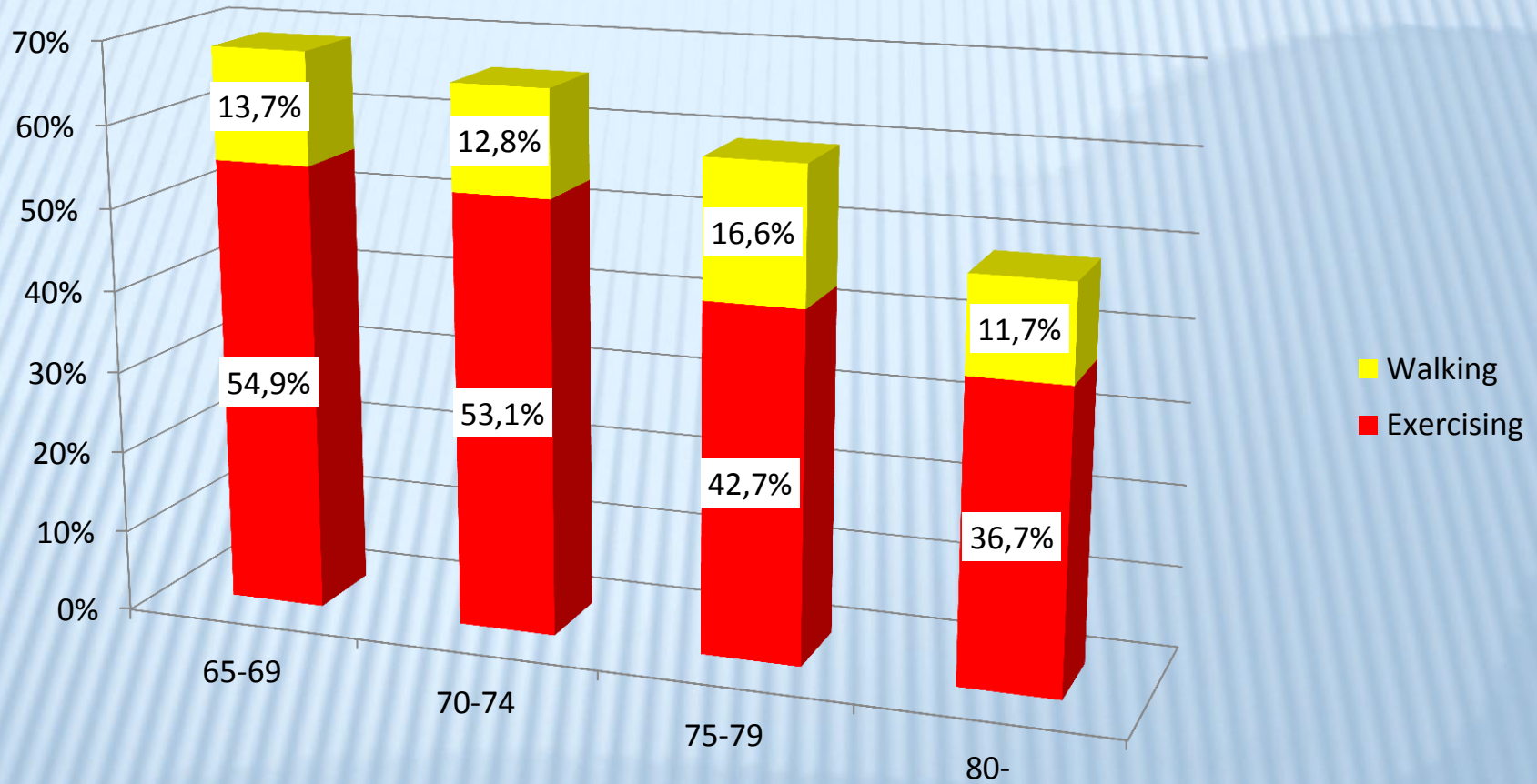
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For Taiwanese women older than 65 years old

- Exercise was a protective factor of successful aging
- For those who didn't exercise, walking was a protective factor of successful aging



# Exercising + Walking by Age



# Discussion

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No matter you “planned to exercise”  
or “forced to walk”  
it’s all better than not moving



**Ke** Keep Moving **g**

# Discussion

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However, it's only correlations

- Couldn't infer that
  - Is it exercising (walking) that raised the probability to age successfully ?
  - Or, is it the ability to exercise (to walk) might be a good index for successful aging ?



# Following Question: 1

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- For those who supposed to have the ability to walk, are there any differences among successful aging criteria between those who did physical activity (exercising + walking) or not ?
  - ▣ Include participants with intact ADL (n = 1,265)
  - ▣ Stratified by age group
  - ▣ Comparing other four successful criteria

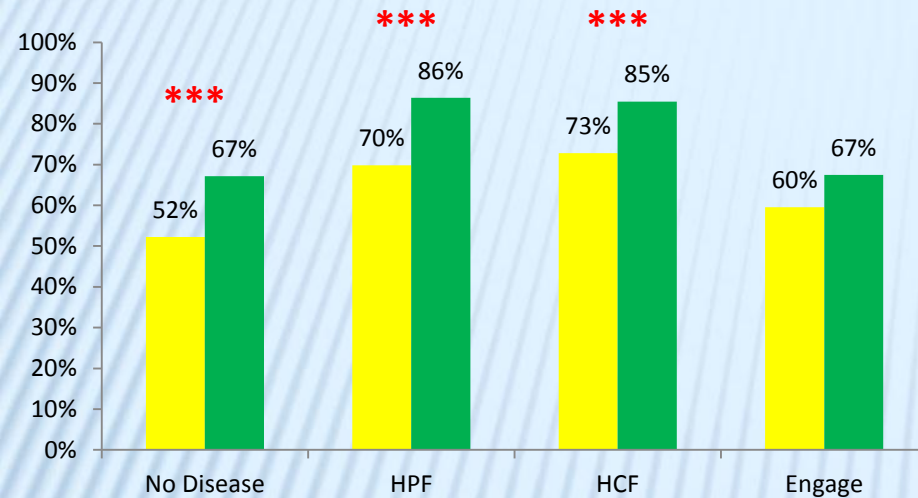


# For Those Without Disability.....

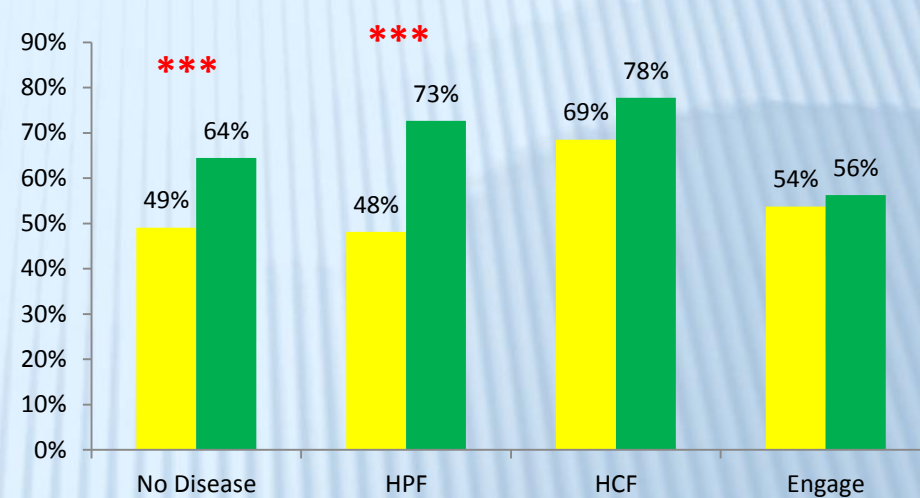
Exercise + Walking

Yes  
No

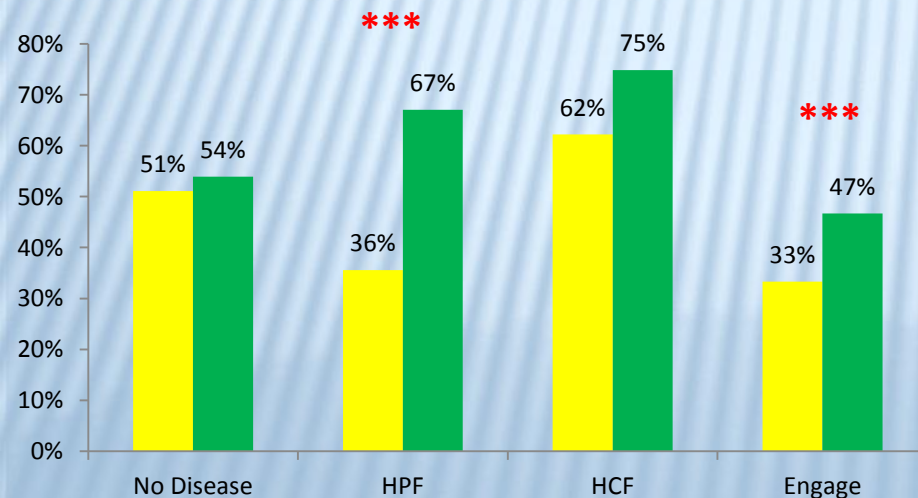
65-69



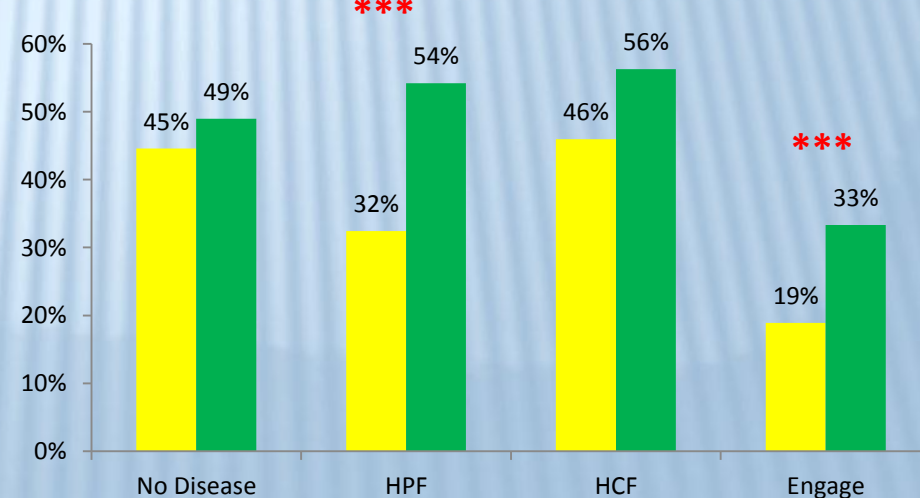
70-74



75-79



80+



# Following Question: 1

- The results showed that those who did exercising or walking, were having higher probability of filling other successful criteria.

	No Disease	High Physical Functioning	High Cognitive Functioning	Active Social Engagement
65-69	***	***	***	
70-74	***	***		
75-79		***		***
80+		***		***

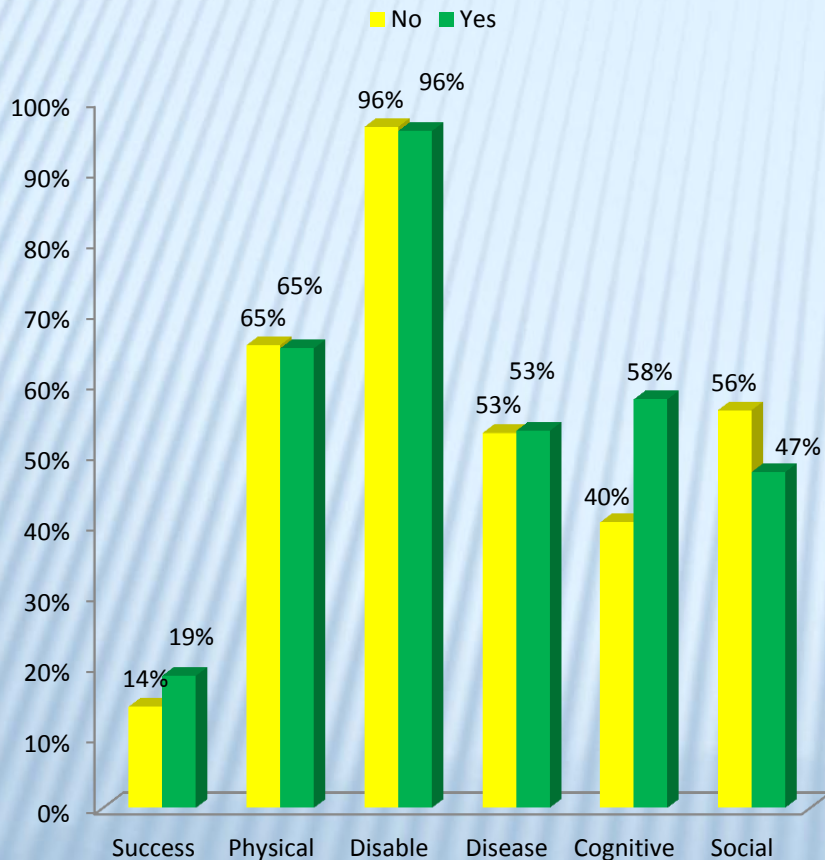
# Following Question: 2

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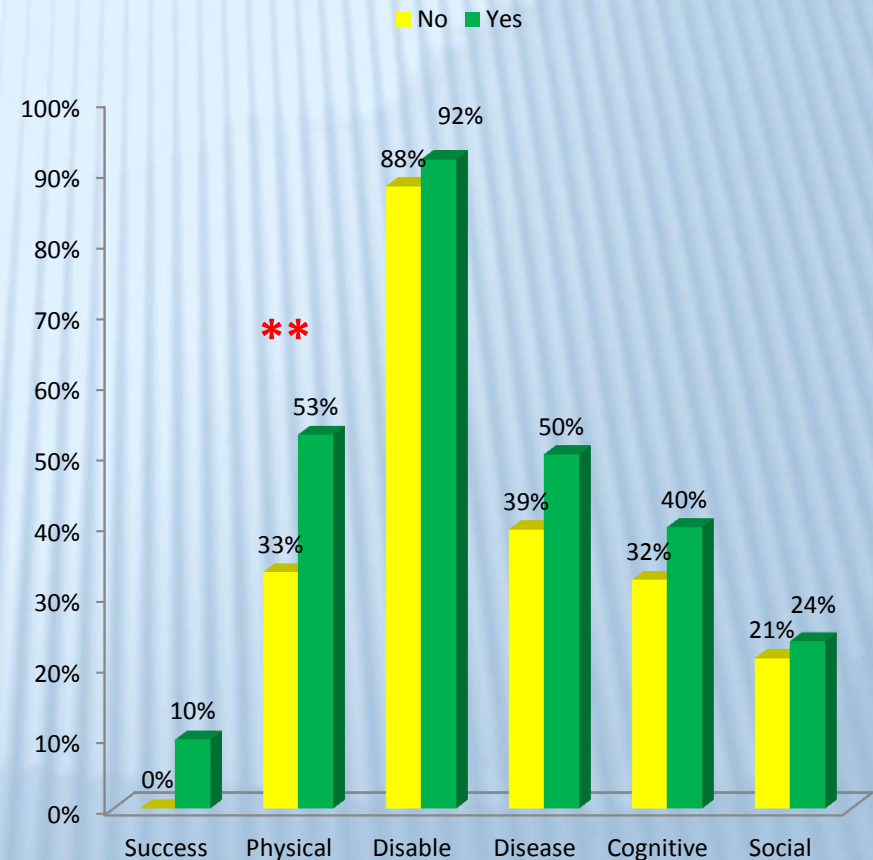
- Could exercising predicts successful aging ?
  - A Preliminary Analysis using TLSA
    - Taiwan Longitudinal Study of Aging (TLSA)
  - Exercise in 1999 → Successful Aging in 2007
    - Exercise: how many times have you exercise in a week?
  - Inclusion criteria
    - Women
    - High Physical Function in 1999
    - No missing data

# Age('99) X Exercise('99) X Successful Aging ('07)

## 64 years old or younger



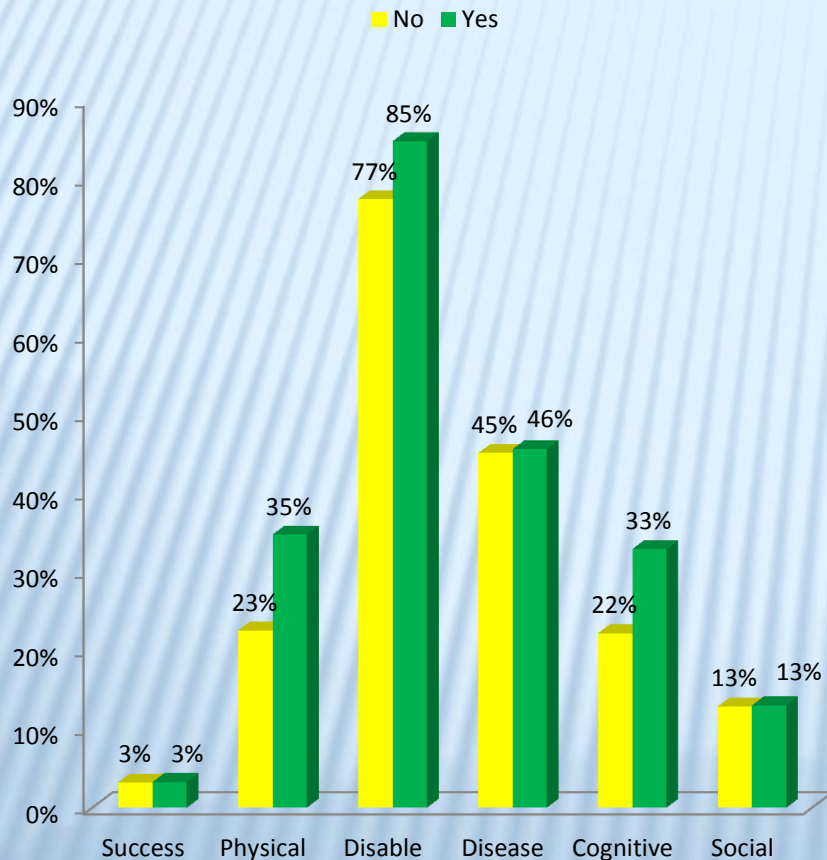
## 65 -69 years old



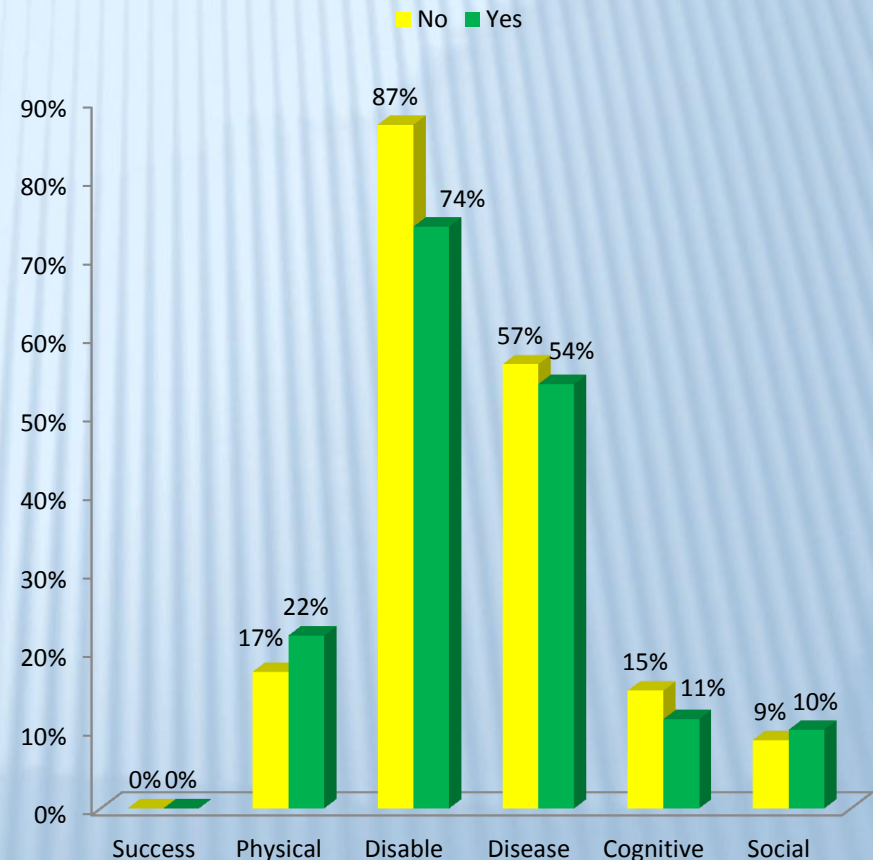


# Age('99) X Exercise('99) X Successful Aging ('07)

## 70-74 years old



## 75 years old or older



## Following Question: 2

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- Those who exercises seems perform better in 8 years follow-up
  - although most weren't statistically significant
  - the only significance were on HPF in the 65-69 years old group
- Need more evidence to clarify: if exercising could predicts successful aging.

# Limitation

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- Cross-sectional data
- Lack of objective measurement of physical function (e.g. walking speed, etc.)
- Lack of subjective measurement of life quality



# Future Research Directions

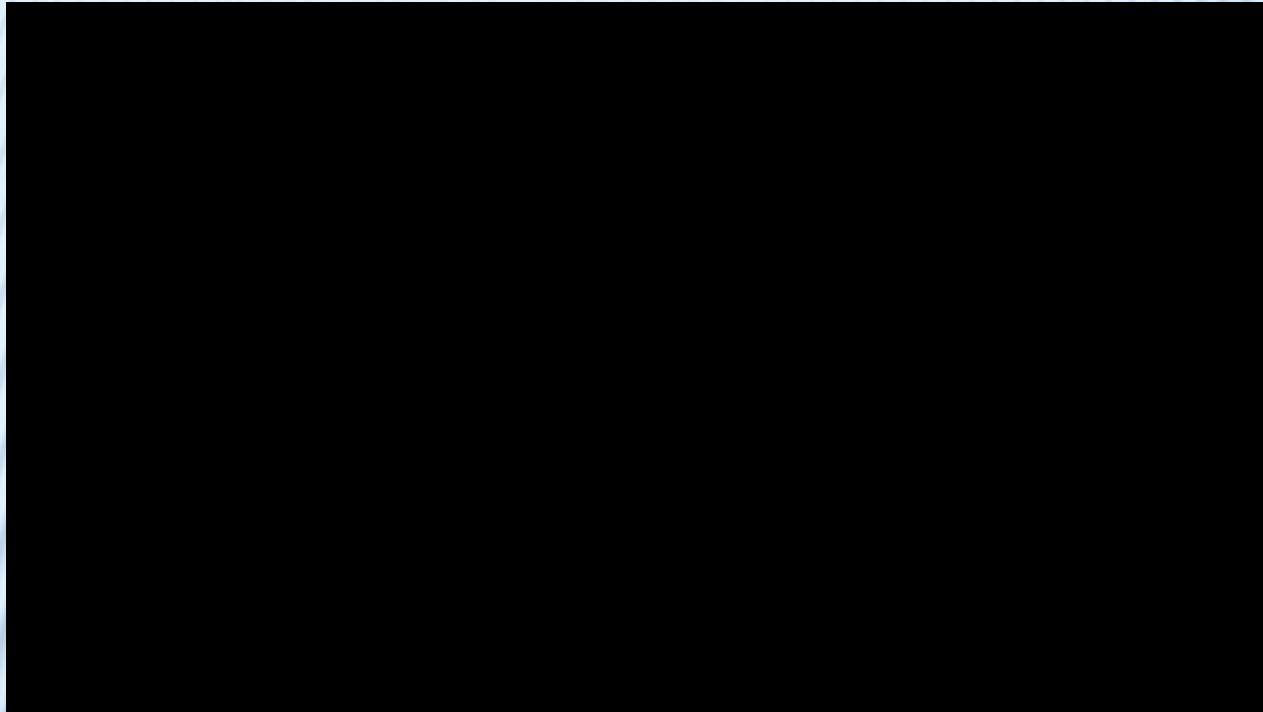
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- Looking into the differences among concepts of aging well (e.g. successful aging, healthy aging, active aging etc.) on health related issues
- Exploring longitudinal data (i.e. TLISA) to
  - Further examine predictors of aging well
  - To explore the correlations among the trend of life style and aging well
  - Examine if, for instance, “Successful ager” live longer, healthier and had better quality of life ?



# The Message

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KEEP MOVING ~~

KEEP WALKING ~~

THANK YOU FOR YOUR  
ATTENTION

