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Presentation of clinical epidemiology study result

開塾　天保9年（1838年）

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Contents

- Research question
- Steps of data analysis.
- Presentation of analyzed data.
- Implications of results.

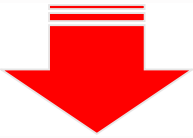
What is research question?

- ✓ The research question sets out what you hope to learn about the topic.
- ✓ This question, together with your approach, will guide and structure the choice of data to be collected and analyzed.

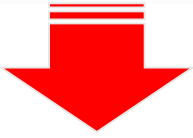
http://www.socscidiss.bham.ac.uk/research-question.html

http://twp.duke.edu/uploads/media_items/research-questions.original.pdf

Research Question



Hypothesis



Specific Aim

Guidelines highlight some of the features of good questions

- Relevant.
- Manageable in terms of research and in terms of your own academic abilities.
- Substantial and with original dimensions.
- Consistent with the requirements of the assessment.
- Clear and simple.
- Interesting.

- **Relevant:** Arising from issues raised in literature and/or practice, the question will be of academic and intellectual interest.

- **Manageable:** You must be able to access your sources of data (be they documents or people), and to give a full and nuanced answer to your question.

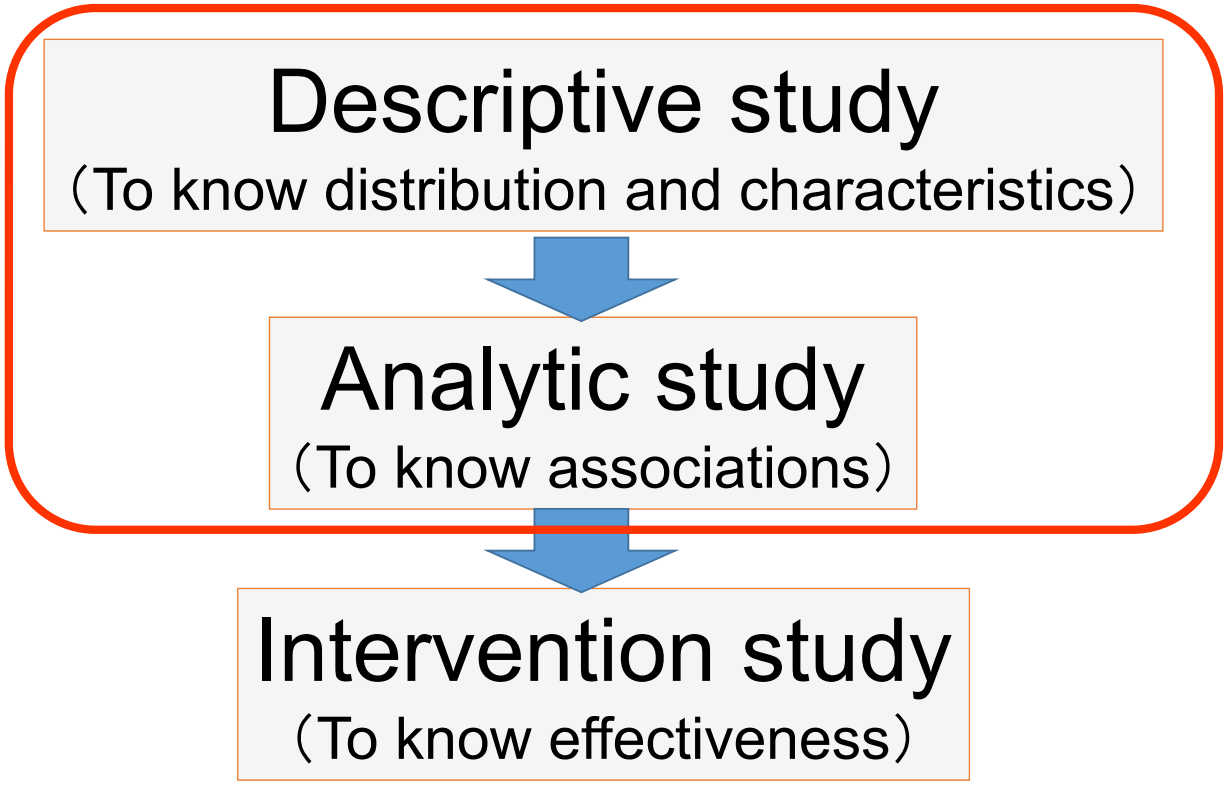
- **Substantial and original**: The question should showcase your imaginative abilities, however far it may be couched in existing literature.

- **Fit for assessment**: Remember, you must satisfy the learning outcomes of your course. Your question must be open to assessment, as well as interesting.

- **Clear and simple**: A clear and simple research question will become more complex as your research progresses.

- **Interesting**: Make your question interesting, but try to avoid questions which are convenient or flashy.

Steps of clinical epidemiology



Descriptive study

- **Checking distribution and characteristics of the participants**: To know the distribution and characteristics may lead adequate advanced analysis.
- **Checking errors:** Data errors may be corrected before main analysis.

Analytic study

- **Estimating associations**: To know associations between outcome and factors.
- **Exploring associated factors:** To explore factors associated with outcome.

An example of research question

A obesity person may be likely to get shortness of breath.

Is it true?

Let's review previous repots

1. Lazarus R,et al. Effects of obesity and fat distribution on ventilatory function: the normative aging study. Chest. 1997;111:891-8.
2. Oda E, et al. Low vital capacity is associated with diabetes despite inverse relationships with metabolic risk factors in lean Japanese men. Intern Med. 2009;48:1201-7. Epub 2009 Jul 15.
3. Oda E, et al. A cross-sectional relationship between vital capacity and metabolic syndrome and between vital capacity and diabetes in a sample Japanese population. Environ Health Prev Med. 2009 ;14:284-91

Several previous reports are found, but the number is not so many.

Finding clinical data

We could collect medical data of 11,376 Japanese individuals who participated in a medical health checkup at Yaesu Medical Heath Checkup Center in Tokyo, Japan, from January to December 2007.

http://www.yaesu-health-support.com/

Let’s make a research question and discuss how to analyze the data.

A research question

To examine associations between vital capacity and obesity, as well as lifestyle-related disorders among Japanese participants of a voluntary health checkup.

What is the first step to analyze the clinical data?

- **Establish the inclusion and exclusion criteria**
- **Checking distribution and characteristics of the participants**
- **Checking errors**

Inclusion and exclusion criteria

Inclusion criteria; Participated in a medical health checkup at Yaesu Medical Heath Checkup Center in Tokyo, Japan, from January to December 2007.

Exclusion criteria; missing data, including body weight and waist circumference (WC) abnormal chest X-ray findings , and past and/or present medical histories of respiratory diseases

How to present distribution and characteristics?

- **The first Table (Table 1) usually shows distribution and characteristics.**
- **As representative values, mean (standard deviation) for parametric data, median (minimum, maximum) for non-parametric data, percentage for categorical data are usually used.**

Table 1. Sex-specific characteristics (N=7892)

	Men			Women		
	Mean (±SD) or N (%)			Mean (±SD) or N (%)		
	Low %VC (<80) (N=521)	Normal %VC (≥80) (N=5006)	P	Low %VC (<80) (N=232)	Normal %VC (≥80) (N=2133)	P[a)]
Age (years)	55.2 (10.2)	48.4 (9.7)	**	53.1 (11.7)	47.5 (10.3)	**
Anthropometric measurements						
Body mass index (BMI)	24.4 (3.4)	23.5 (2.9)	**	21.9 (3.8)	21.1 (3.1)	**
Waist circumference (cm)	87.9 (9.5)	85.2 (7.9)	**	80.4 (10.7)	78.0 (8.7)	**
Family history (present)						
Cardiovascular disease	75 (14.4)	601 (12.0)		39 (16.8)	307 (14.4)	
Cerebrovascular disease	90 (17.3)	750 (15.0)		43 (18.5)	355 (16.6)	
Diabetes mellitus	61 (11.7)	657 (13.1)		34 (14.7)	321 (15.0)	
Hypertension	108 (20.7)	1103 (22.0)		75 (32.3)	645 (30.2)	
Malignant neoplasm	193 (37.0)	1622 (32.4)	*	83 (35.8)	744 (34.9)	

Mean (standard deviation) is used for continuous variables

Number (percentage) is used for categorical variables

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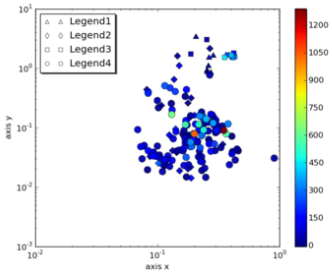
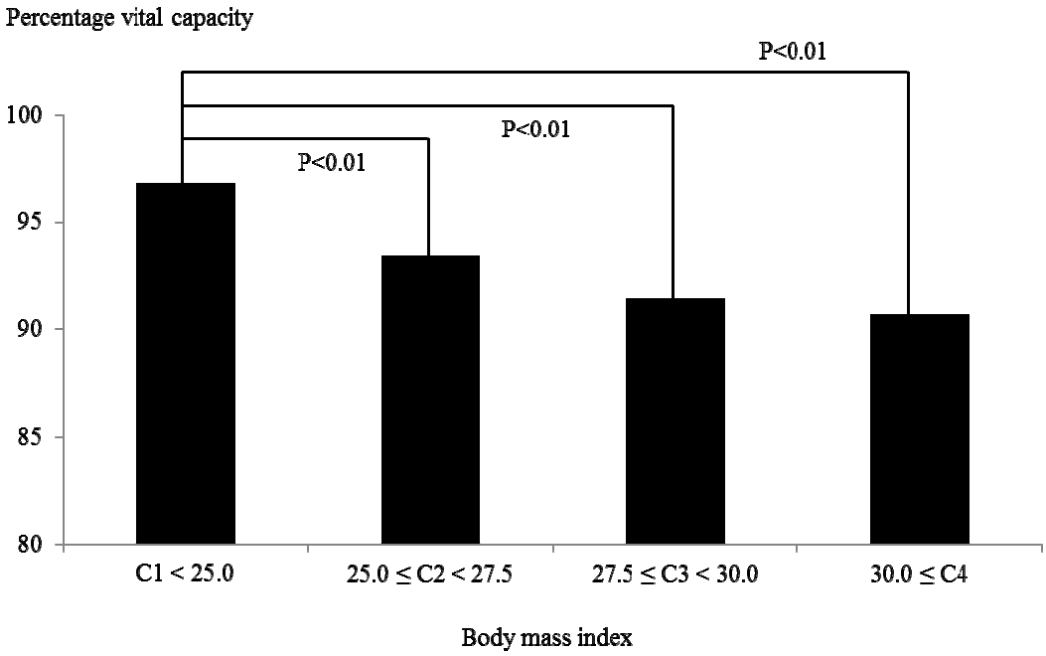
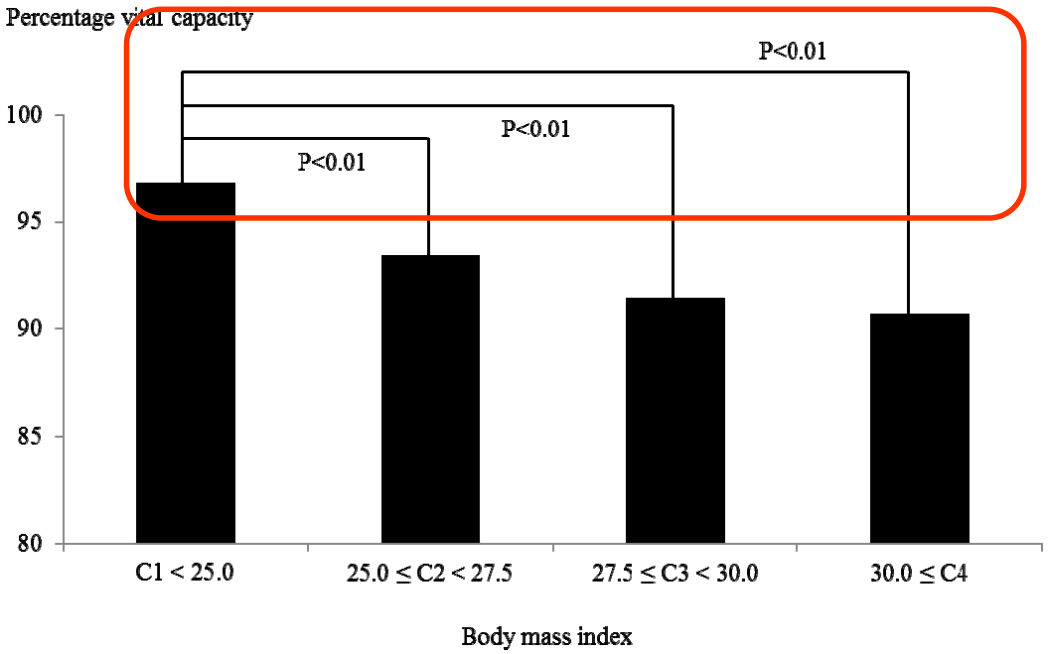
As for presentation of “P value”, asterisk mark is sometimes used (*P<0.05, **P<0.01). Direct input also may be applicable.

- **If you are willing to show a specific data, scatter graph, bar graph, circle graph may be suitable.**



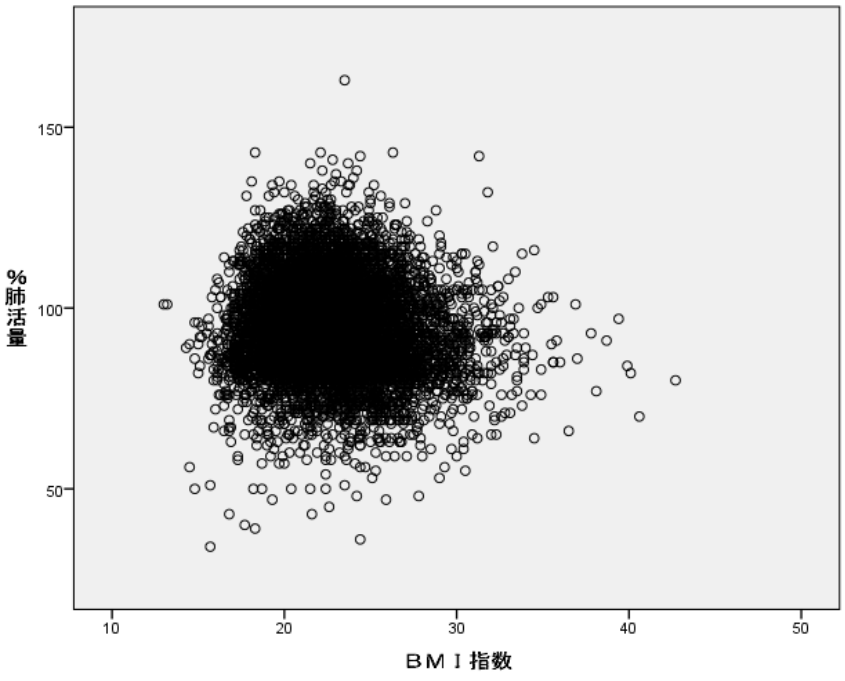


I was interested in the association between obesity level and % vital capacity. I made a Figure to show the trend of % vital capacity associated with BMI quartiles



Statistical significance was estimated by Dunnett's method. We could compare % vital capacity between C1 and other quartiles.

Scatter graph to show the relationship between % vital capacity and BMI at each individual revel.



How to present analytic study data?

Which statistical methods do you use?

- Linear regression analysis
- Logistic regression analysis
- Correlation analysis

Table 2. Factors associated with low % vital capacity among male participants (N=5527)
(Logistic regression analysis)

		Univariate analysis			Model 1[c]			Model 2[d]		
	N (%)	OR[a]	95% CI[b]	*P*	OR[a]	95% CI[b]	*P*	OR[a]	95% CI[b]	*P*
Age (years)[e]		1.87	1.71-2.04	**	1.98	1.81-2.17	**	1.85	1.68-2.04	**
Anthropometric measurements										
Body mass index (BMI)										
C1 < 25.0	3990 (72.2)	Reference			Reference					
25.0 ≤ C2 < 27.5	1040 (18.8)	2.11	1.71-2.60	**	2.10	1.72-2.56	**			
27.5 ≤ C3 < 30.0	331 (6.0)	2.25	1.63-3.10	**	2.37	1.75-3.23	**			
30.0 ≤ C4	166 (3.0)	2.67	1.76-4.06	**	3.46	2.34-5.12	**			
Waist circumference (cm)			-							
C1 < 85	2614 (47.3)	Reference						Reference		
85 ≤ C2 < 90	1419 (25.7)	1.51	1.20-1.90	**				1.40	1.10-1.78	**
90 ≤ C3 < 95	833 (15.1)	1.73	1.14-2.25	**				1.55	1.17-2.03	**
95 ≤ C4	661 (12.0)	2.65	2.06-3.41	**				2.51	1.92-3.30	**

Order; Univariate analysis, Multivariate analysis

Number (%), Odds ratio, 95% confidence interval, and P value

Implication of multivariate analysis

		Univariate analysis			Model 1[c]			Model 2[d]		
	N (%)	OR[a]	95% CI[b]	*P*	OR[a]	95% CI[b]	*P*	OR[a]	95% CI[b]	*P*
Age (years)[e]		1.87	1.71-2.04	**	1.98	1.81-2.17	**	1.85	1.68-2.04	**
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Waist circumference (cm)			-							
C1 < 85	2614 (47.3)	Reference						Reference		
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95 ≤ C4	661 (12.0)	2.65	2.06-3.41	**				2.51	1.92-3.30	**

C4 was 3.46 times likely to have low % vital capacity (<80%) compared to reference (C1) after adjusting by cofounders.

Environ Health Prev Med
DOI 10.1007/s12199-014-0431-5

REGULAR ARTICLE

Body mass index and waist circumference are independent risk factors for low vital capacity among Japanese participants of a health checkup: a single-institution cross-sectional study

Yoko Goto · Hirohide Yokokawa · Hiroshi Fukuda ·
Toshio Naito · Teruhiko Hisaoka · Hiroshi Isonuma

Environ Health Prev Med.2015 ;20:108-15.