Figure 11.5. OBSERVATIONAL PLANS: Physical Activity and Health

EM9005: Cambridge Report, February 24, 1990, page 7A

FITNESS AND YOU

There's proof walking reduces risk of death

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It's hard sometimes, and a little frustrating too, to provide people with the proof they demand that improved physical activity habits will pay off for them.

Because of the difficulty of isolating causes and effects when doing lifestyle research, and because of the relatively recent start on lifestyle research, in the field of fitness there has not been much in the way of 'ironclad, irrefutable, money in the bank, swear on your mother's grave' type evidence about the links between physical activity and good health.

And you can't blame people for requesting this type of evidence. After all, physical activity is hard work as most people see it, and it wouldn't be prudent for them to invest a lot of time and energy when the results were still somewhat in doubt.

If the results were certain or the energy investment were less, maybe things would be different for some people.

Fortunately, a recent study has provided good news on two fronts for these people. First, the results of the study, conducted in Dallas at the Institute for Aerobic Research, indicate that exercise confers significant protection from all causes of death – reducing the risk of death by ½ or more in men and women.

Second, the exercise level required to achieve most of this protection is quite manageable for the average person – as little as a 30 minute, 2 mile walk each day.

Previous studies, of course, have reached similar conclusions about the relationship between physical activity and longevity. In particular, protection against cardio-vascular disease has been well-established.

What makes this study important is its size and scope. The study has been called the most comprehensive fitness study ever conducted.

The study, published in the *Journal of the American Medical Association* in November, followed 13,344 subjects for eight years. Apart from the large sample size and long-term observation period, this study has also improved on previous studies by including both men and women (where most other studies included only men). In addition, the study continuously took objective treadmill measures of participants' fitness rather than relying on participants' self-reports of how much they exercise, which had been the standard for previous studies.

The study began with healthy participants who were divided into five groups based on their fitness levels. The lowest fitness group (group 1) was comprised of primarily sedentary people while the highest fitness group was comprised of people who exercised regularly, including individuals who ran as much as 40 miles per week.

Persons with pre-existing heart disease or hypertension were excluded from participation in the study. At the end of the 8 year study, 283 of the participants had died.

STUDY FINDINGS

In short, the important findings of this study were these;

∗ that risk of death from all causes is reduced by one-half or more in both men and women by being physically active;

∗ that in addition to protection from heart and vascular disease, exercise also provides protection from death attributable to a wide variety of other causes, including cancer;

∗ that risk of death can be cut by one-half simply by moving from a sedentary life-style to very light activity, approximately equivalent to walking 2 miles in one half-hour each day;

∗ that risk of death continues to decrease as exercise levels increase but that returns diminish as activity level increases beyond the half-hour walk intensity.

Although the mechanisms providing protection remain largely a mystery, the message is becoming clear. Quite plainly, people who exercise, even moderately, live longer.

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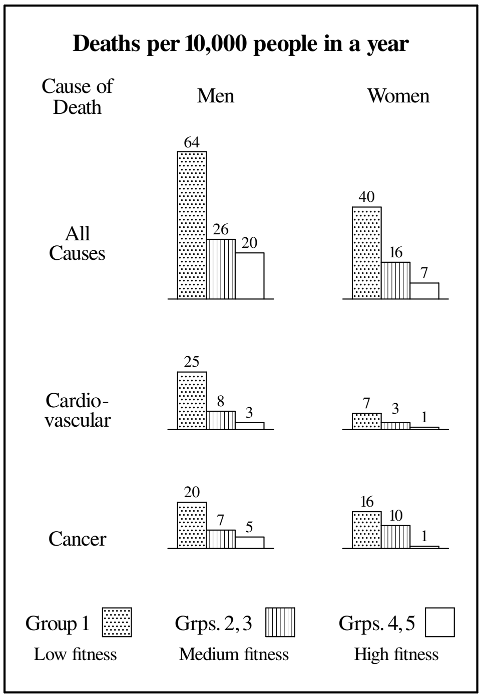

REFERENCE: Blair, S.N., Kohl, H.W., Paffenbarger, R.S., Clark, D.G., Cooper, K.H. and L.W. Gibbons: Physical Fitness and All-Cause Mortality. A Prospective Study of Healthy Men and Women. *J. Amer. Med. Assoc.* **262**(#17): November 3, 2395-2401 (1989). [D.C. Library call number PER R15.A48]
See also the editorial on page 2,437 of the same issue of this journal.

1 In the second paragraph of the article reprinted above, Mr. Abbott refers to .... *the difficulty of isolating causes and effects when doing lifestyle research* ..... .

- To what *statistical* issue is Mr. Abbott referring? Explain briefly.
- Outline the reason(s), if any, why the usual difficulties associated with this matter are *more* acute in the case of 'lifestyle research', as Mr. Abbottt seems to imply.

(*continued overleaf*)

2 In the fifth paragraph of the left-hand column of the article reprinted overleaf on page 11.9, it is stated that the investigation was carried out at the Institute for Aerobic Research in Dallas, Texas. Indicate briefly how this information affects your assessment of the accuracy of the investigation's Answers.

3 In the last paragraph of the left-hand column overleaf on page 11.9, Mr. Abbott states: *What makes this study important is its size and scope.*

- Indicate briefly the characteristics of the investigation to which Mr. Abbott is referring.
- Explain briefly the *statistical* importance of these characteristics.
- The second sentence of the same paragraph states: *The study has been called the most comprehensive fitness study ever conducted*. What desirable piece of information is *not* given here? Briefly justify your answer.

4 Comment briefly on the following words or phrases as they are used in the article:

- in the title of the article: *proof*;
- in the fifth paragraph of the left-hand column: *all causes of death*;
- in the fifth paragraph of the left-hand column: *by ½ or more*;
  - in the second-last paragraph of the middle column: *by one-half or more*;
  - in the second paragraph of the right-hand column: *by one-half*;
- in the first paragraph of the middle column: *continuously*;
- in the second-last paragraph of the middle column: *by being*;
  - how would the statistical implications of the sentence be affected if these two words were altered to *who are*? Explain briefly.
  - in the second paragraph of the right-hand column: *by moving*;
- in the second paragraph of the right-hand column: *very light.*

5 Of the 13,344 participants in the study (mentioned at the top of the middle column overleaf on page 11.9), 10,224 were men and 3,120 were women; the 283 deaths (mentioned two paragraphs later in the article) comprised 240 men and 43 women. Outline the *statistical* implications of this information.

6 In the first paragraph of the middle column overleaf on page 11.9, Mr. Abbott refers to .... *treadmill measures of participants' fitness* ..... Discuss briefly the advantage(s) and the *dis*advantage(s) of this procedure in the context of the investigation.

7 Comment briefly on the *statistical* issues raised in the middle column of the article by the second paragraph: *The study began .... 40 miles per week.*

8 In the third paragraph of the middle column overleaf on page 11.9, it is stated that people who already had heart disease or high blood pressure were excluded from taking part in the investigation.

- Suggest reason(s) why this was done.
- Indicate briefly how these exclusions affect the Answers from the investigation.

9 Comment critically on the statements in the last paragraph of the middle and right-hand columns overleaf on page 11.9 that .... *exercise also provides protection from death attributable to a wide variety of other causes, including cancer* .... and .... *the mechanisms providing protection remain largely a mystery* .....

10 If you were currently sedentary and wanted to reduce your risk of death, should you become more active on the basis of the information presented overleaf on page 11.9 in the report of the investigation? Explain briefly.