

Risks & Odds Illustrations

Example: Preventing blood clots in immobilized patients

Patients immobilized for a substantial amount of time can develop deep vein thrombosis (DVT), a blood clot in a leg or pelvis vein. DVT can have serious adverse health effects and can be difficult to diagnose. On its website, Pfizer reports the outcome of a study looking at the effectiveness of the drug Fragmin compared with that of a placebo in preventing DVT in immobilized patients.

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In a double-blind multinational study, severely immobilized patients were randomly assigned to receive daily subcutaneous injections of either Fragmin or a placebo for 12 to 14 days and were monitored for 90 days. The results, in number of patients experiencing a complication from DVT (including death), are summarized in the following table.

Example: Preventing blood clots in immobilized patients

Treatment	Outcome		Sample size
	Complication	No complication	
Fragmin	42	1476	1518
Placebo	73	1400	1473

- 1 Is this study retrospective or prospective?
- 2 For those in the treatment group, find the probability that the subject experienced a complication.
- 3 Find the probability of a complication among those who received a placebo.
- 4 Find the value of the absolute risk reduction for complications in the treatment and placebo groups.

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Treatment	Outcome		Sample size
	Complication	No complication	
Fragmin	42	1476	1518
Placebo	73	1400	1473

- 1 Find the number needed to treat with Fragmin compared with doing nothing beyond a standard treatment to prevent one complication. What does this value tell you?
- 2 For those in the treatment group, find the odds in favour of a complication, and the odds against a complication.
- 3 Find the relative risk of a complication for those in the treatment group compared to those in the placebo group. Interpret the result.
- 4 Find the odds ratio for complications in the treatment group compared to those in the placebo group. Interpret the result.

Example: Age at first birth in breast cancer cases with comparable controls

- **Hypothesis:** The risk of breast cancer increases as the length of time between *age at menarche* (i.e. age when menstruation begins), and the *age at first childbirth* increases.

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- This theory would explain in part why the incidence of breast cancer seems higher for women in the upper socioeconomic groups, because they tend to have their children relatively late in reproductive life.

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- This theory would explain in part why the incidence of breast cancer seems higher for women in the upper socioeconomic groups, because they tend to have their children relatively late in reproductive life.
- An international study was set up to test this hypothesis.
- Breast-cancer cases were identified among women in selected hospitals in the United States, Greece, Yugoslavia, Brazil, Taiwan, and Japan.
- *Controls* were chosen from women of comparable age who were in the hospital at the same times as the cases but who did *not* have breast cancer.

Example: Age at first birth in breast cancer cases with comparable controls

	Age at first birth		
Status	≥ 30	≤ 29	Total
Case	683	2,537	3,220
Control	1,498	8,747	10,245
TOTAL	2,181	11,284	13,465

- All women were asked about their age at first birth.
- The set of women with at least one birth was arbitrarily divided into two categories: (1) women whose age at first birth was ≤ 29 years, and (2) women whose age at first birth was ≥ 30 years.
- Source: Based on *WHO Bulletin*, 43, 209-221, 1970.

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	≥ 30	≤ 29	
Case	683	2,537	3,220
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TOTAL	2,181	11,284	13,465

- 1 Is the study retrospective or prospective?
- 2 Find the value of the absolute risk reduction for breast cancer in the group whose age at first birth is ≥ 30 and the group whose first age at first birth is ≤ 29 .
- 3 For those whose age at first birth is ≥ 30 , find the odds in favor of breast cancer.

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- 1 Find the odds ratio for breast cancer in the group whose age at first birth is ≥ 30 compared to the group whose age at first birth is ≤ 29 . Interpret the result.
- 2 Does having a child later in a woman's reproductive life increase her risk of breast cancer? Explain.