

Question 1

To determine whether using Solvit causes depressive disorder, we need to find large amount of people who have and haven't used Solvit as well as people who have and haven't experienced depressive disorder symptoms, and do research study to analyze the statistic. There are two epidemiologic researches that can be carried out in order to study the case. One is **Cohort Study** and the other is **Case Control Study**.

Cohort Study compares people who exposed to people not exposed in the 'potential cause', the usage of Solvit in this case, and follows them forward in time. The strengths of doing Cohort Study is that there is **no recall bias** since we follow and study the people when the study is being started instead of tracing back their history. Therefore people are not required to give answers by their memories. Besides, we can **estimate the incidence rate and the relative risk**. But there are also weaknesses, such as **expensive study cost** and **long research and follow up time**. Besides, we may **loss contact** with the people we are studying and attrition bias may occur in the research.

While doing Case Control Study, we need to find people who have depressive disorder and ask whether they have used Solvit in the past, and compare them with those who have no depressive disorder. Strengths for this kind of study are **no hypothesis is required** and it's **easier to do** since we can **find cases from clinics** and it **takes less time to complete**. The main weakness is **biased recall**. Although people may sometimes give bias answers, you still need to rely on their given information. **Temporality** is another weakness since we cannot tell whether the symptoms of depressive disorder happened before or after the use of Solvit.

I prefer doing Cohort Study. Although it may take longer time to get the result, it provides more accurate and relevant conclusion. We can calculate both Relative Risk and Relative Odds. We can also study if there is relationship between the frequency or amount of Solvit used and occurrence of depressive disorder. It gives a very good picture of whether we should ban Solvit.

(All information is from lectures of week 3)

Question 2

Cohort Study

In the Cohort study of the association of Solvit with occurrence depressive disorder, we have invited 150,000 people living in Oklahoma to take part. We give them self-report questionnaire and do follow up interviews with them one year after. There are 12547 people not traceable and therefore we end up with gathering 137,453 persons' data.

	Major Depression	No Major Depression	Total
Solvit exposed	15050	44723	59773
No Solvit exposed	10907	66773	77680

To describe the measures of association of depression with use of Solvit that might be produced, we need to calculate the Relative Risk and Relative Odds.

Relative Risk: $(15050/59773)/(10907/77680) = 1.79$

Relative Odds: $(15050/44723)/(10907/66773) = 2.06$

Both ratios here show the relationship between Solvit and depressive disorder is not significantly strong although it seems to have some relationship to a certain extent.

Case Control Study

In the Case Control Study, we have contacted 13 different clinics in Oklahoma and found 2558 people who have depressive disorder and 3004 people who have no depressive disorder to complete the research.

	Depressive Disorder	No Depressive Disorder
Often exposed to Solvit	1899	1903
Non or light exposed to Solvit	659	1101

Relative Odds: $(1899/1903)/(659/1101) = 1.67$

The Odds is quite low. The only conclusion is that Solvit is associated with depressive disorder, but we cannot tell firmly that it's actually Solvit causing depressive.

Due to limitations and weaknesses of each study, it is hard to conclude the research results connecting depression to use of Solvit. Krieger has talked about The Web of Causation in Social Science and Medicine, 1994 about **strength**, both designs of study show relatively low Relative Risk and Odds. We cannot say the relationship is strong. **Dose-response** cannot be reflected in Case Control Study. Therefore the results are less convincing. **Consistency** is another issue. Since the study is only take part in Oklahoma, we cannot know whether same result might be obtained in different areas or countries. **Temporality** also matters. We have to make sure the depression disorder happened after using Solvit. Otherwise results are much less meaningful. When considering **specificity**, we are almost unable to match depressive disorder with Solvit since there may be many other factors that cause depressive such as lack of social support, pressure due to low education level or tight financial condition. At last, according to the Consumer Reports 2012, the solvents in Solvit are only being suspected that might cause depressive disorder. There is still no proof of it. Therefore, **biological plausibility** is not high.