How to maximize use of MS Access in research studies

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Encountered problems

- Select all the patients with high blood pressure and age between 25 and 65
- Match demographical information with the medical history for 50,000 people
- Allow more than one user to access the database simultaneously
- Share the research data within the team

Get a solution

- The basic solution is to use an RDBMS (Relational Database Management System)
- Several examples – Oracle, DB2, SQL, MySQL, FileMaker, and MS Access
- We are going to use Access today

Reasons to use Access

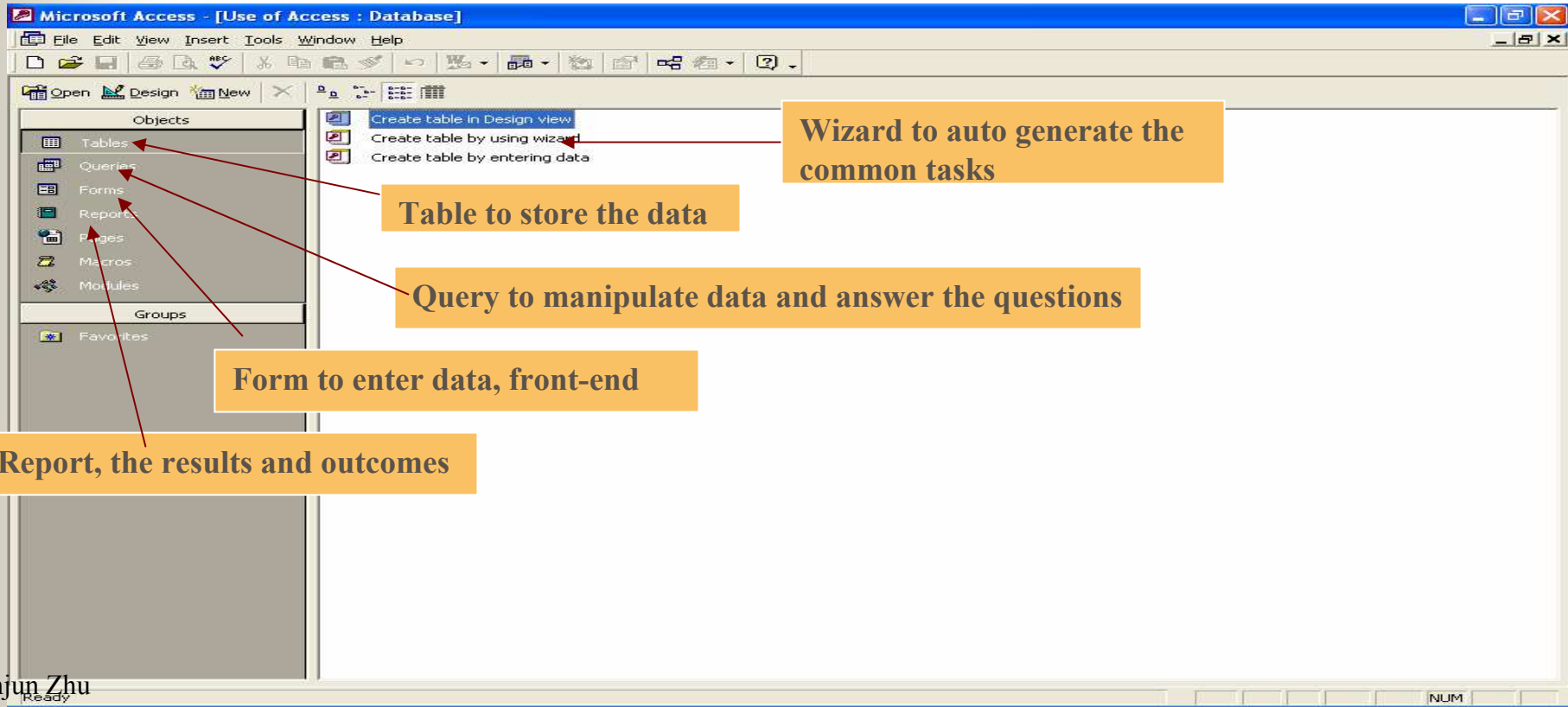
- Easy to install and it comes with MS office
- Available all over campus
- No financial burden
- Fit small to medium size database
- Through today' class, you are familiar with it and do what you want to do

Objectives

- Some database terms and ideas
- Briefly show you how to start creating your own DB
- Practical use of Access in your research studies
  - Manage your study
    - ✓ Track the progress of your study
    - ✓ Merge to MS word and other documents
  - Enter the research data
    - ✓ Monitor your core research data
    - ✓ Add graph to the Form
  - Interim data analysis
    - ✓ Work on Report
- Wrapping up

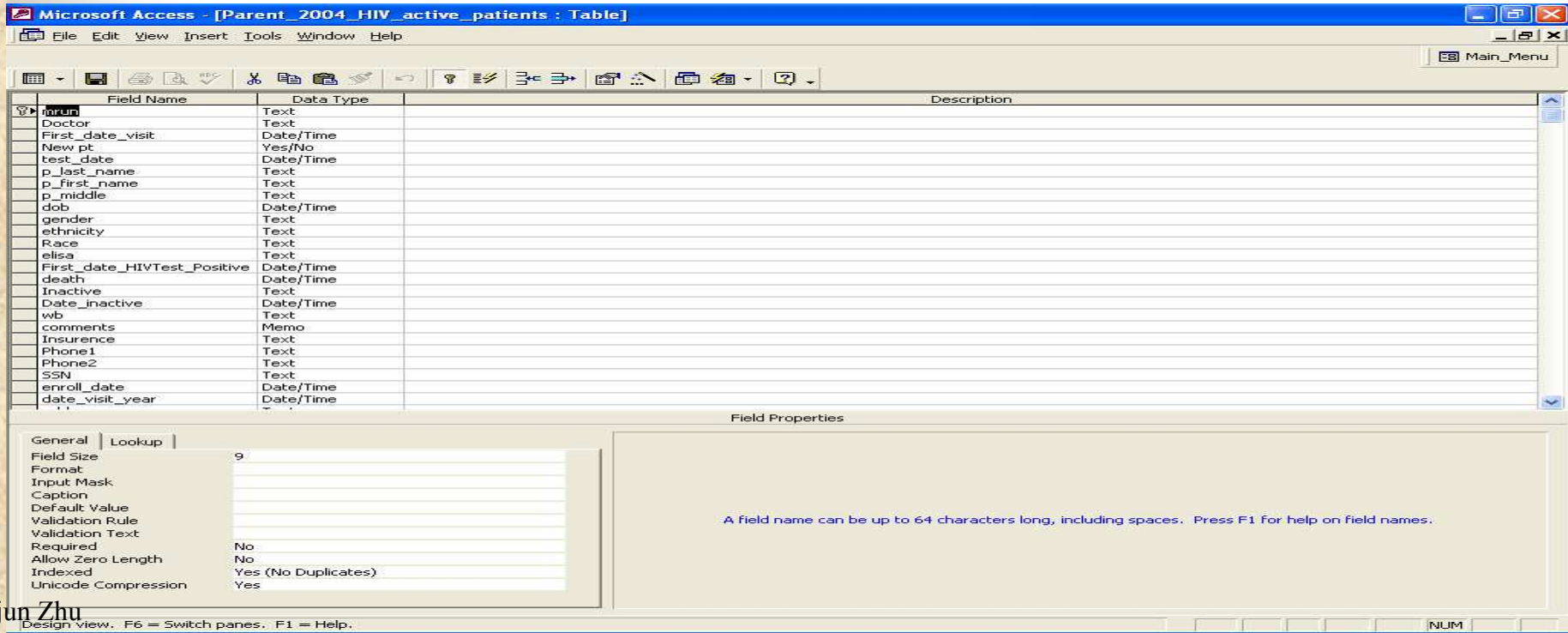
Areas in a DB view

Tables → Queries →Forms → Report →Wizards at the top of each area to help you with common tasks



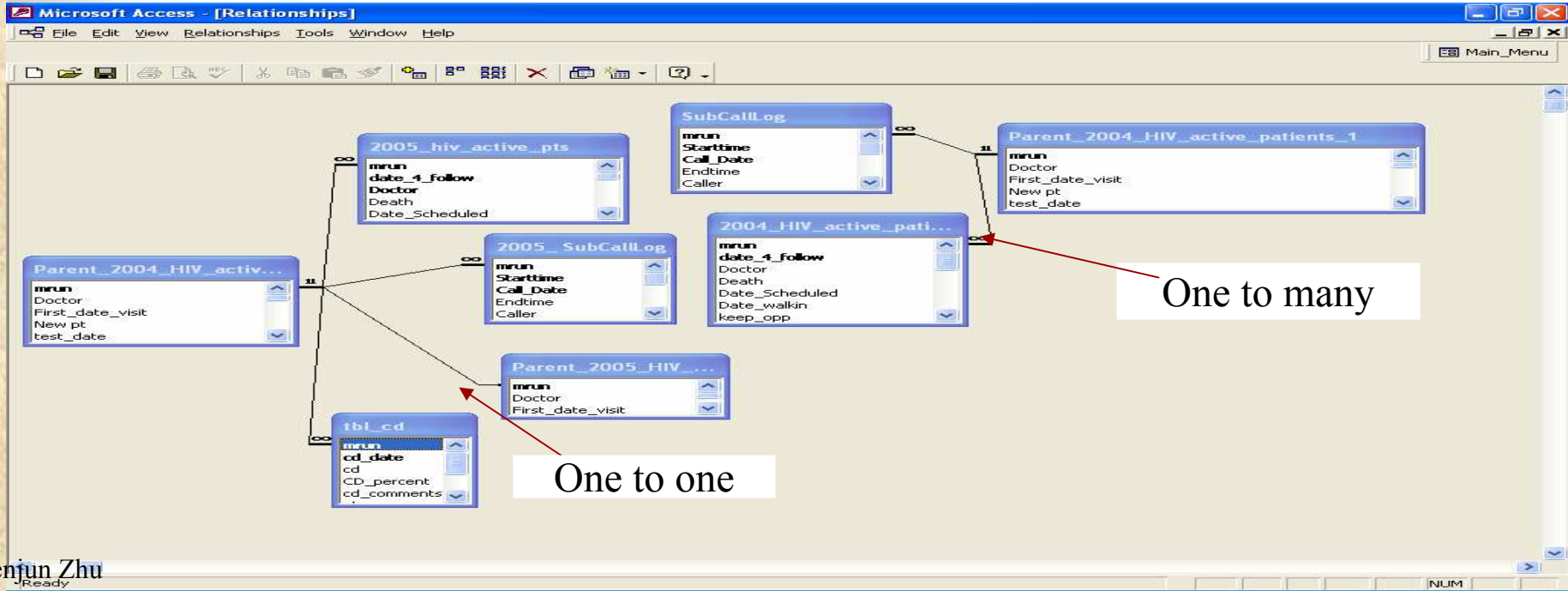
Table

- Unique ID (primary key)
- Unique names
- To be defined as a type (text, date… or more details floating point, string…)



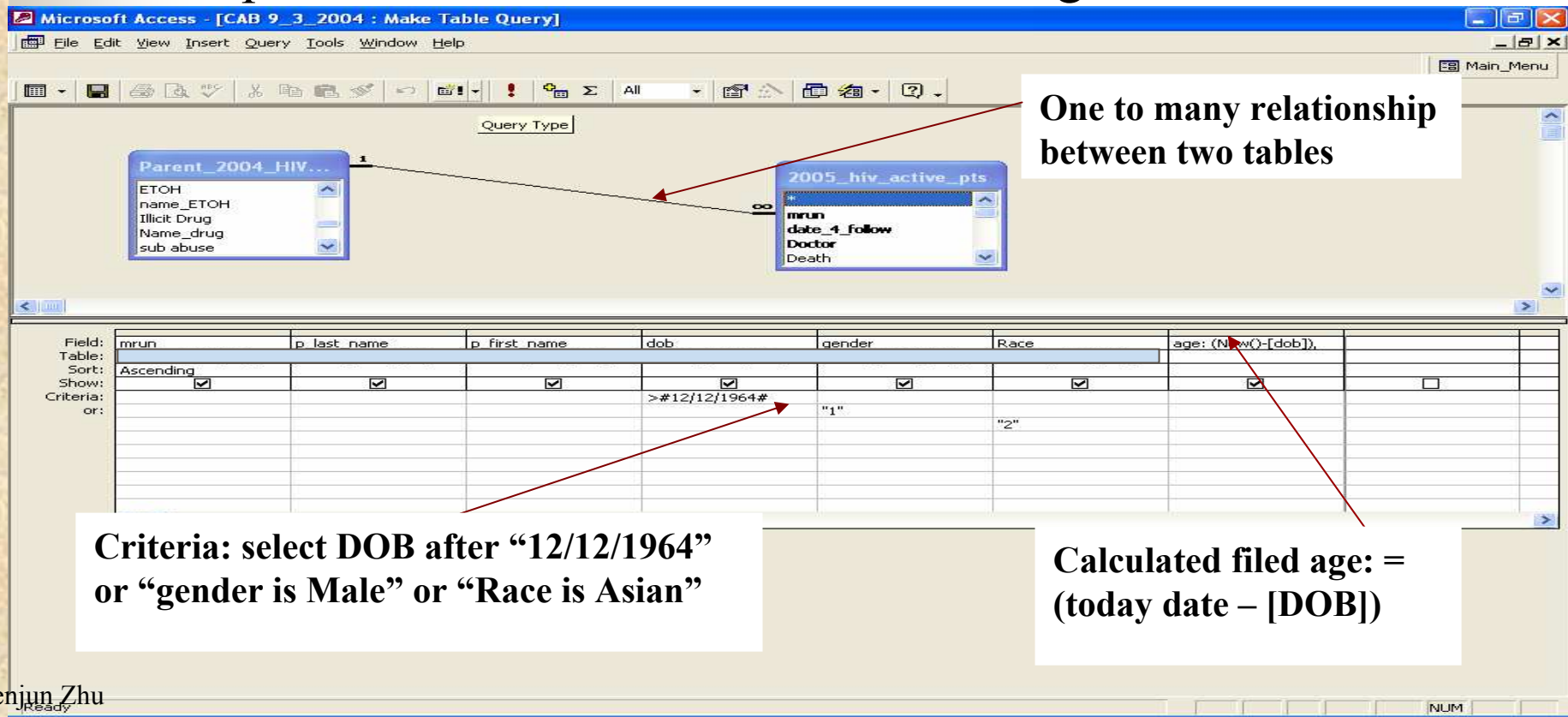
Relationships between tables

- One to one –one row in one table goes to only one row in another table
- One to Many – one row in one table (parent) goes to multiple rows in another table (child)
  - ✓ Parent primary key is a foreign key in the child table



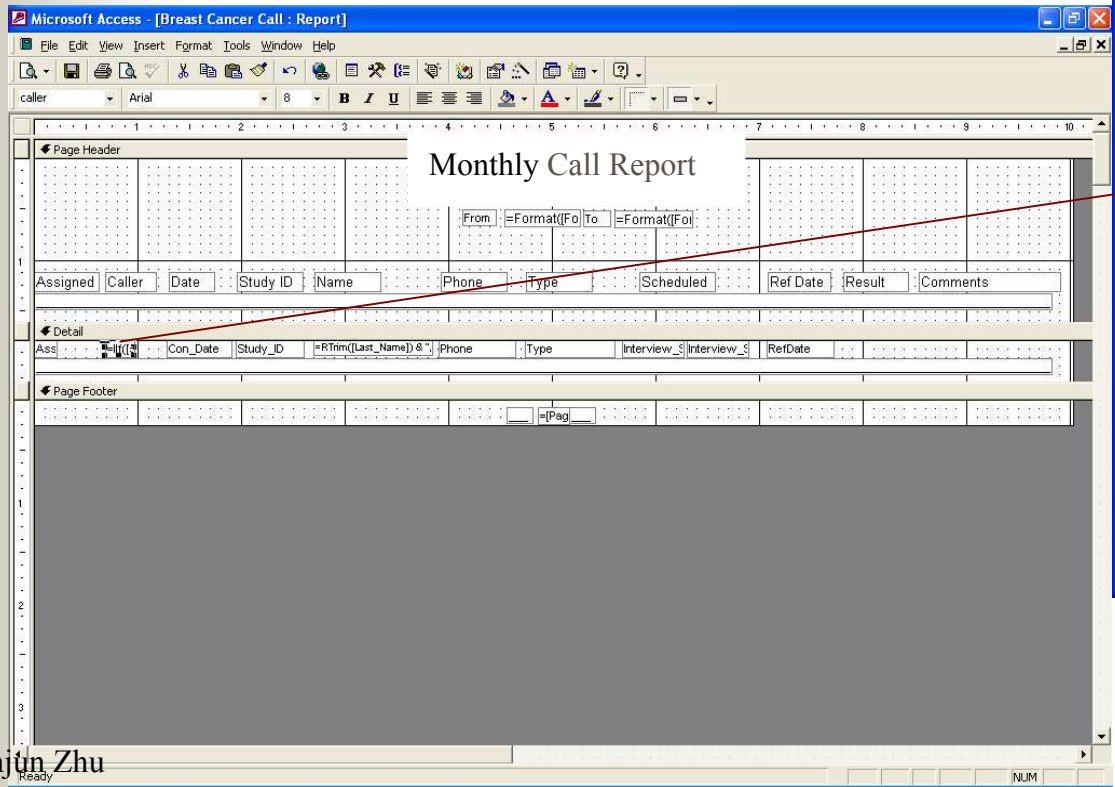
Queries

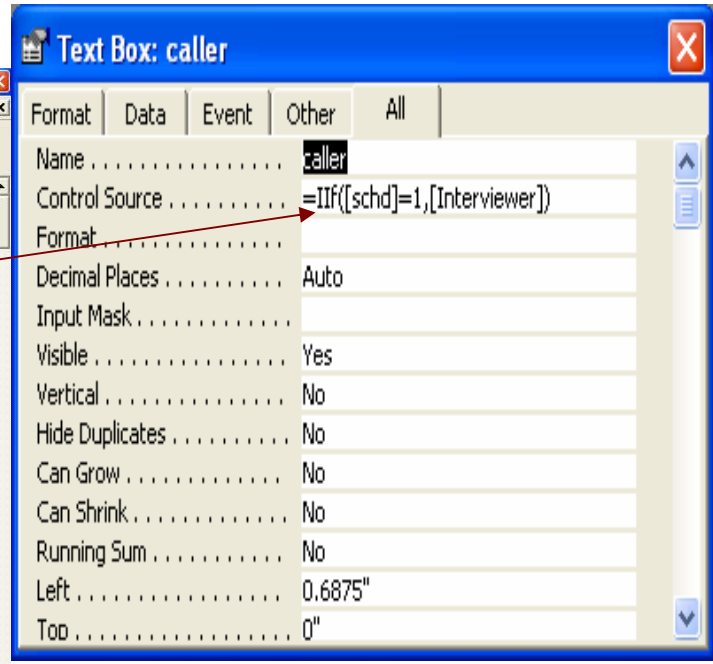
- You can save the queries and use them as tables
- Add to a query
- Edit data directly in the query
- Update all values in a column according to criteria



Reports

- Manipulate the data through expression (IIf, SUM, Means, etc.).
- Answer the questions
- Outcomes/ results





Working with external data

- Methods:
  - ✓ Link: creates a link to a table in another Access database or links to the data from different database format
  - ✓ Import: Copies data from a text file, another Access database, or another application's format into an Access table
  - ✓ Export: Copies data from an Access table to a text file, another Access database, or another application's format

Working with external data (cont'd)

- Usually work on a query
- Rarely from a table
- Queries make the data "similar"
- Cut and past (work well with Excel)
- Directly export to statistical software (SAS, SPSS…)
- Good for working on the data without accessing to other database

Working with external data (cont'd)

- Access can move data among several categories of applications and 15 different file types
  - ✓ Other Windows application
  - ✓ Macintosh application(FoxBASE, FoxPro, Excel)
  - ✓ Spreadsheets
  - ✓ PC database management systems
  - ✓ Server-base database systems (SQL, Oracle …)
  - ✓ Text and/or other mainframe files

Tracking the patient recruitment

- A scenario

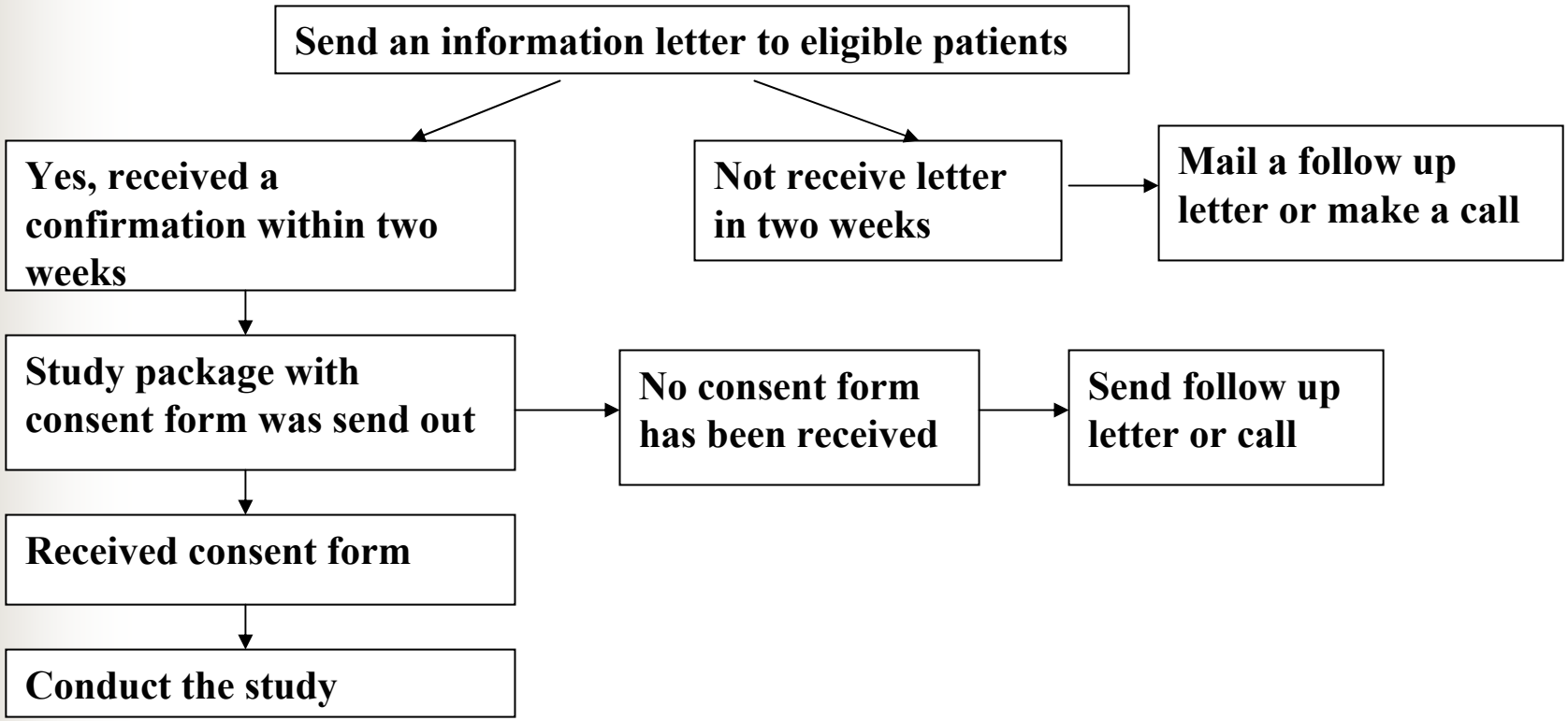
  A case-control HIV clinical trial study:

  The physicians have identified the eligible patients who will participate a HIV clinical trial study in five different Nashville hospitals. This study will last two years and requires several clinical visits.

- Data I used for today:

  Case-control HIV clinical trial study. (de-identified some fields)

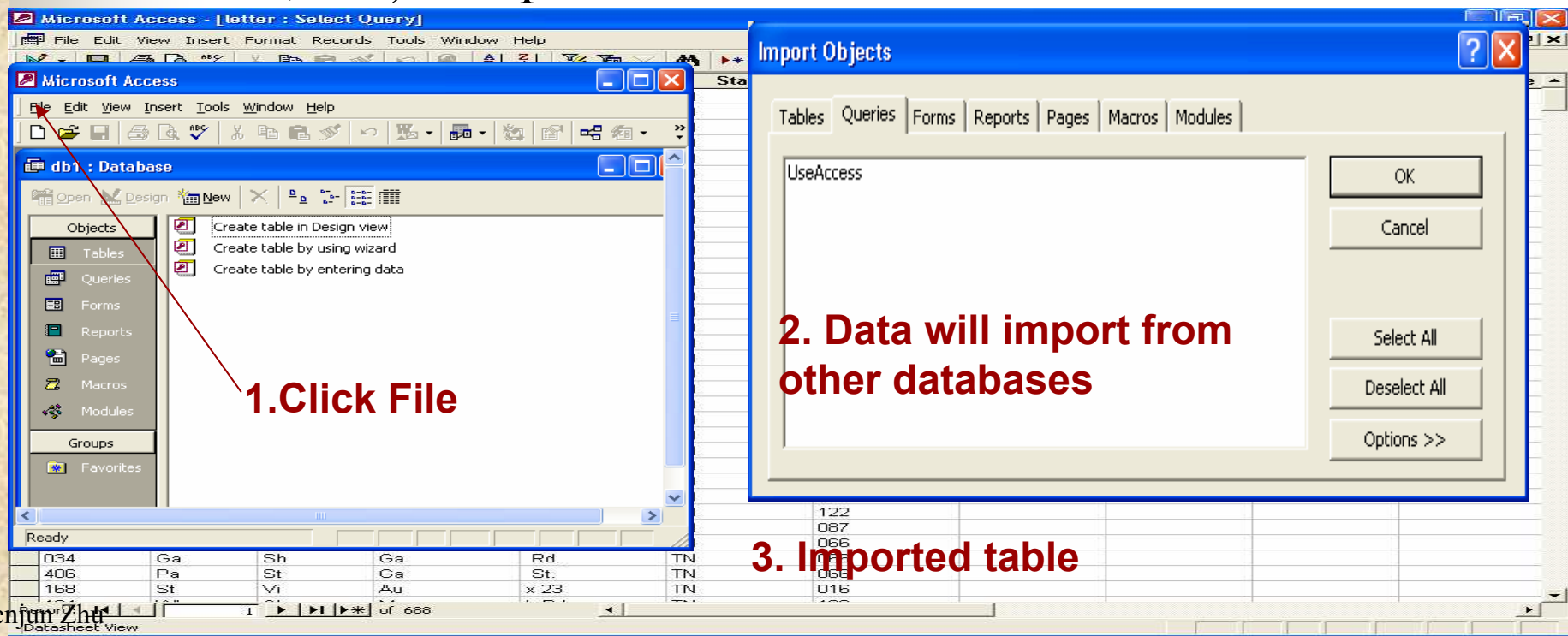
The flow chart of the patient recruitment



Four types of letters need to be sent out – merging to MS Word Documents

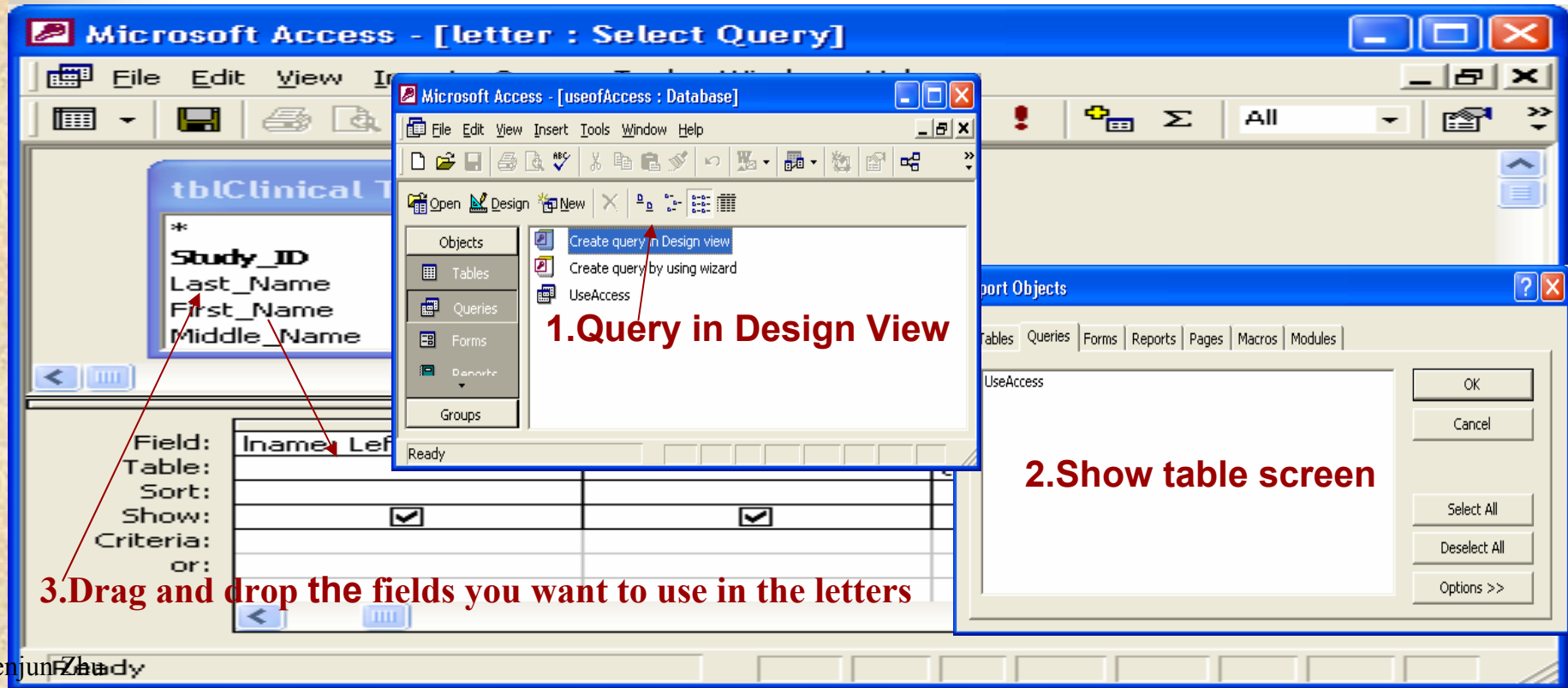
Tracking the progress of your study

- **First step**: Import data from existing database
- The procedures: Click table on the DB view→file →get external data →import →located the specific data file (text, Excel, etc.)→import file



Tracking the progress of your study (cont'd)

- **Second step**: create a query from the table
  - ✓ Click query on DB view →create query in design view→select the table from show table screen →add →Name the query as "letters" →Close the query

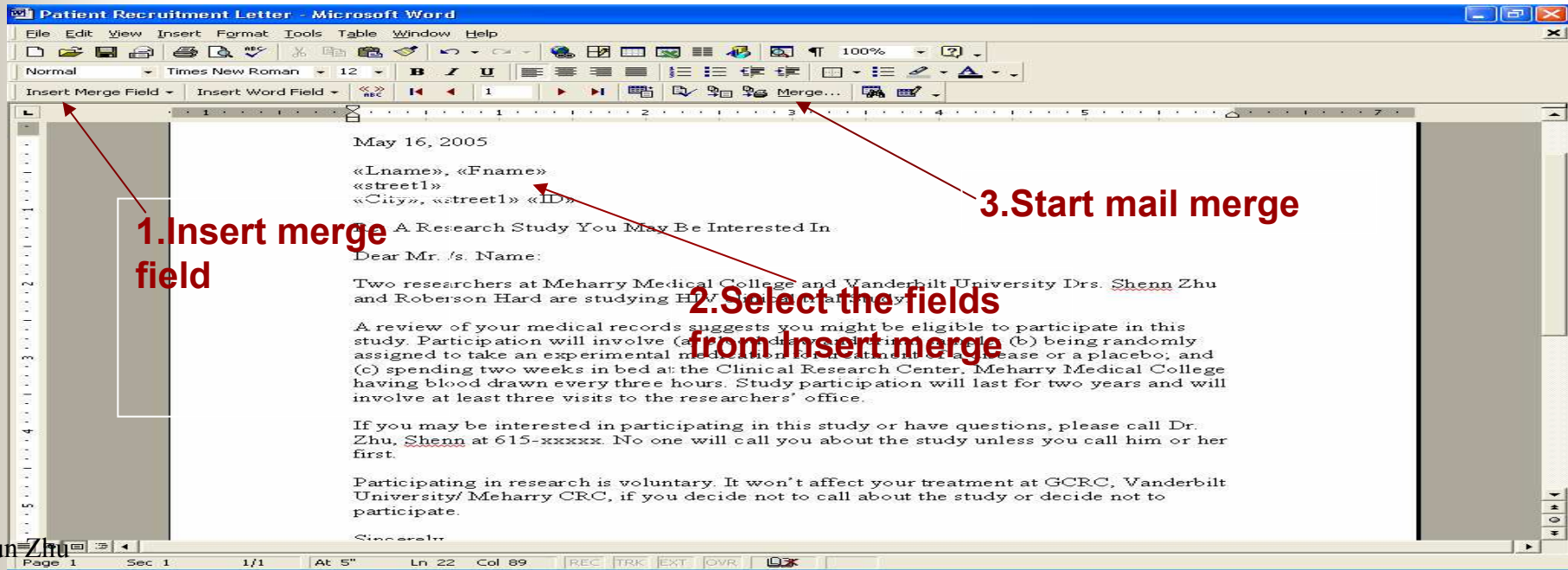


Link MS Word documents

- **Step three**: link data to MS word documents
- Click the query in the DB view →highlight "letter"→go the word of officelind on the menu bar →select " link your data to an existing MS Word document" →Ok
- Select "recruitment letter" in the file selection screen

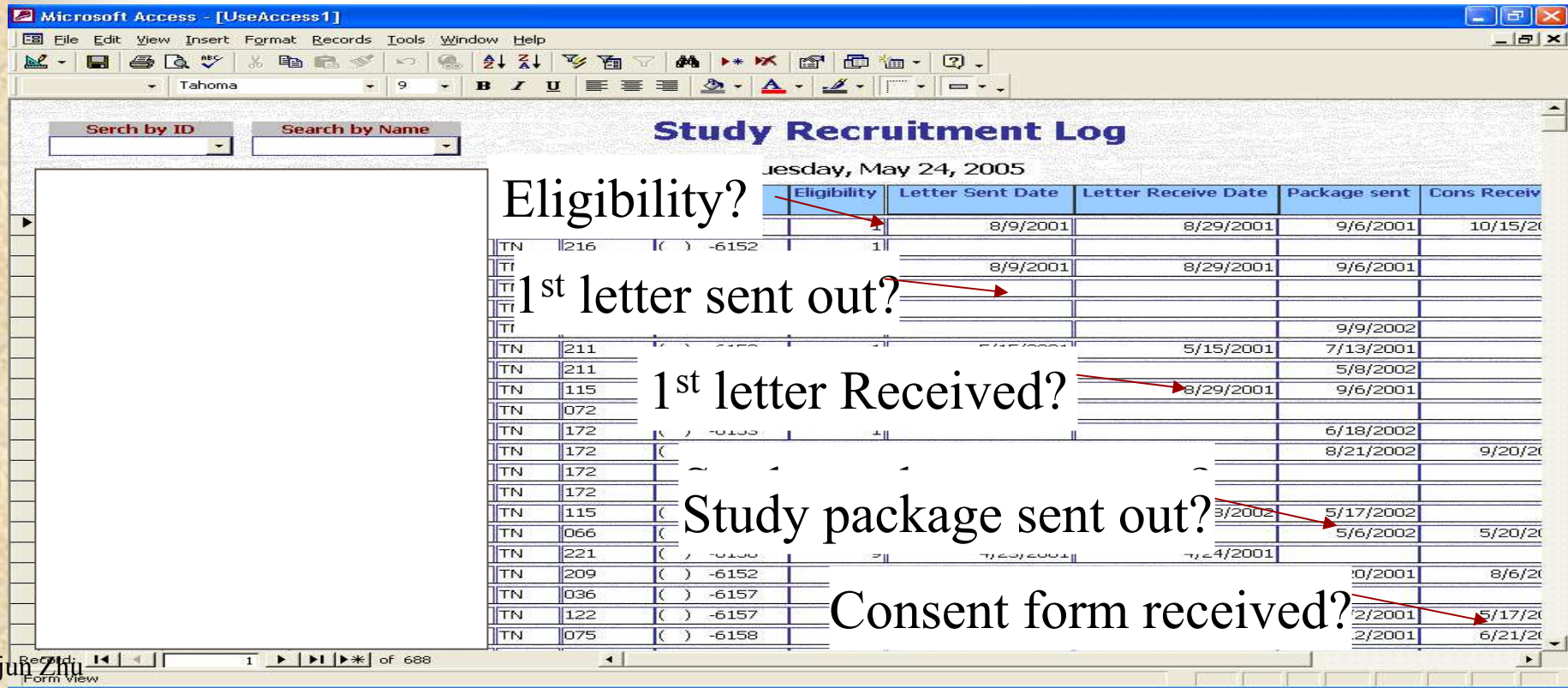
Link MS Word documents (cont'd)

- The MS Word document open →click insert merge field → select "last name, first name, address etc." to your letter →start mail merge
- All patients' letters were done in a minute
- In the same way, we can produce the mailing labels



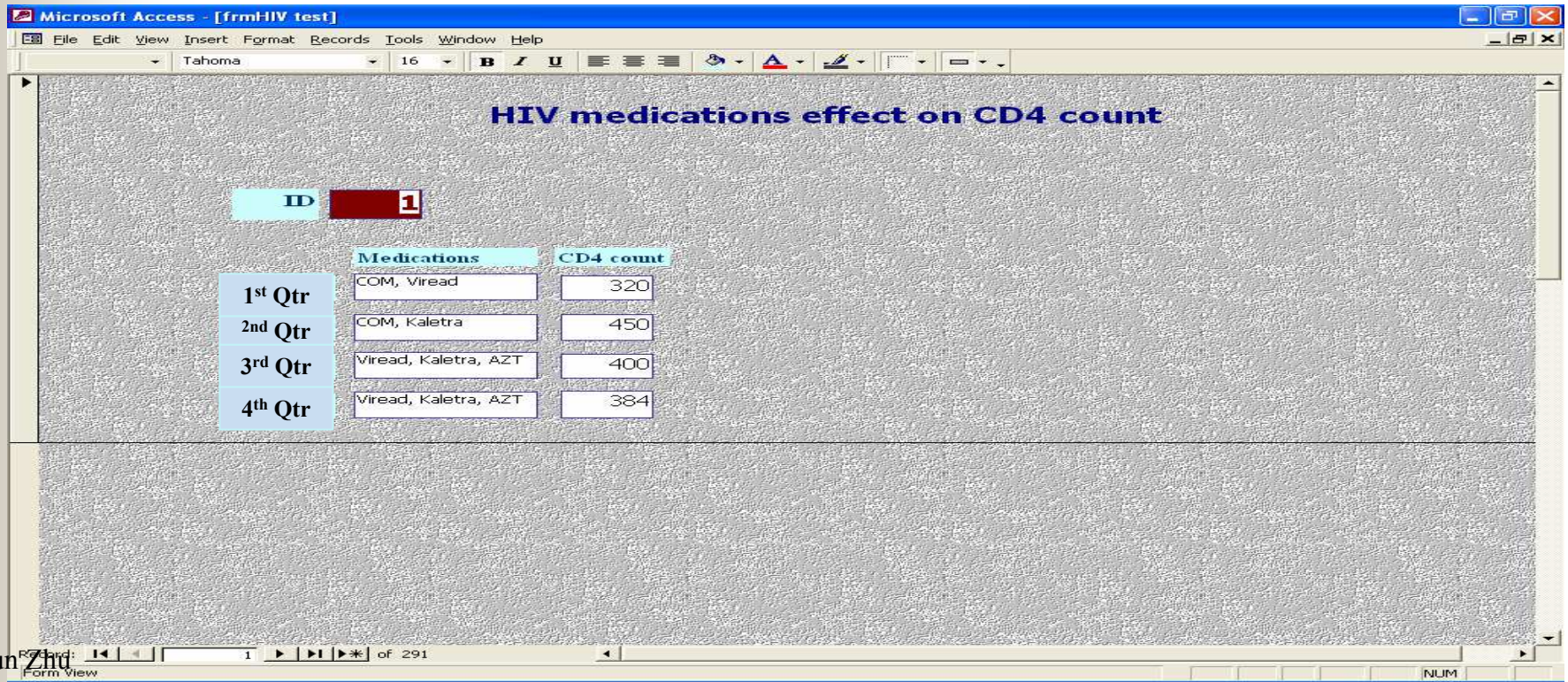
Decision making: what can you do for next?

1. Do you have enough participants for the study?
2. How many follow up letters do you need to send out? Etc.
3. Use the queries again to generate the follow up and consent form letters.



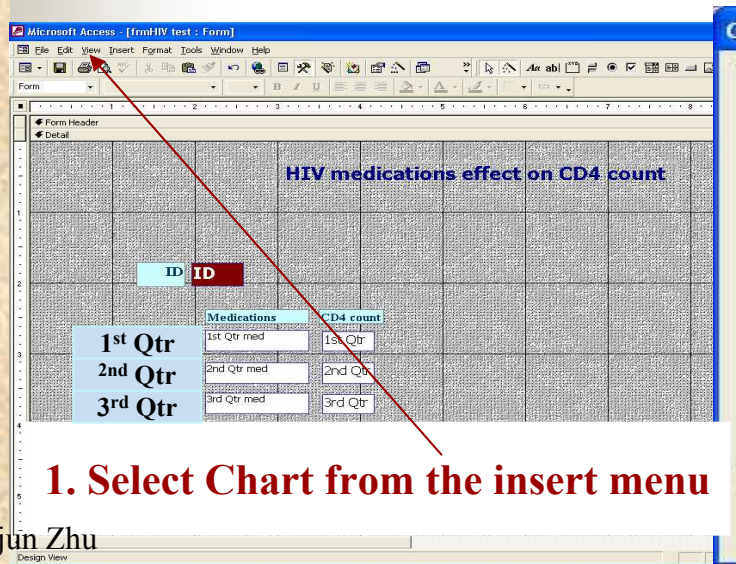
Monitor your core study data

- **<u>Add the graph to the form</u>** – how the medications (Highly Active Antiretroviral Therapy -- HAART) effect on the CD4 count.



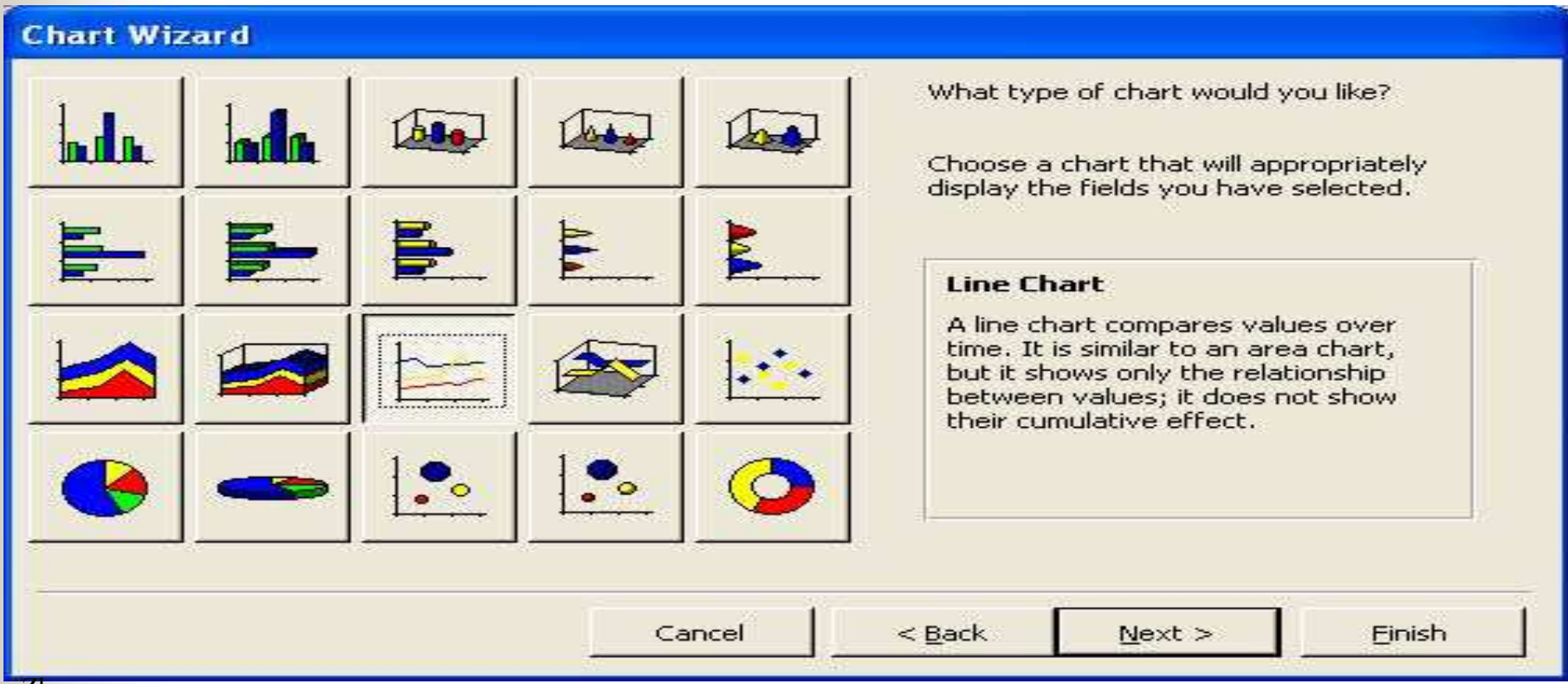
Add the graph to the form

1. Click design view on view menu
2. Select Chart from the insert menu
3. Drag the box to the desired size on the right-hand portion of the form
4. The Wizard screen lets you select the table or query
5. Choose the HIV test table as the source for the graph



Add the graph to the form (cont'd)

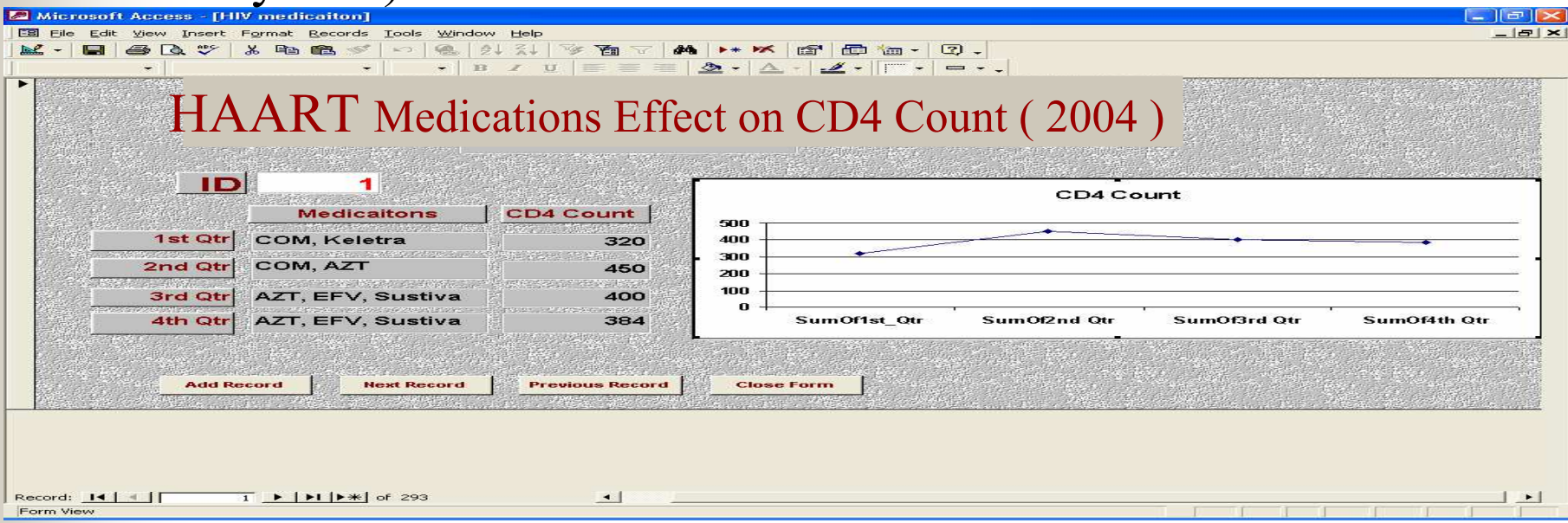
6. Click on Next → to go to the next Wizard screen
7. Select 1st Qtr – 4th Qtr, then click ok to go to next screen
8. Select line chart, then go next



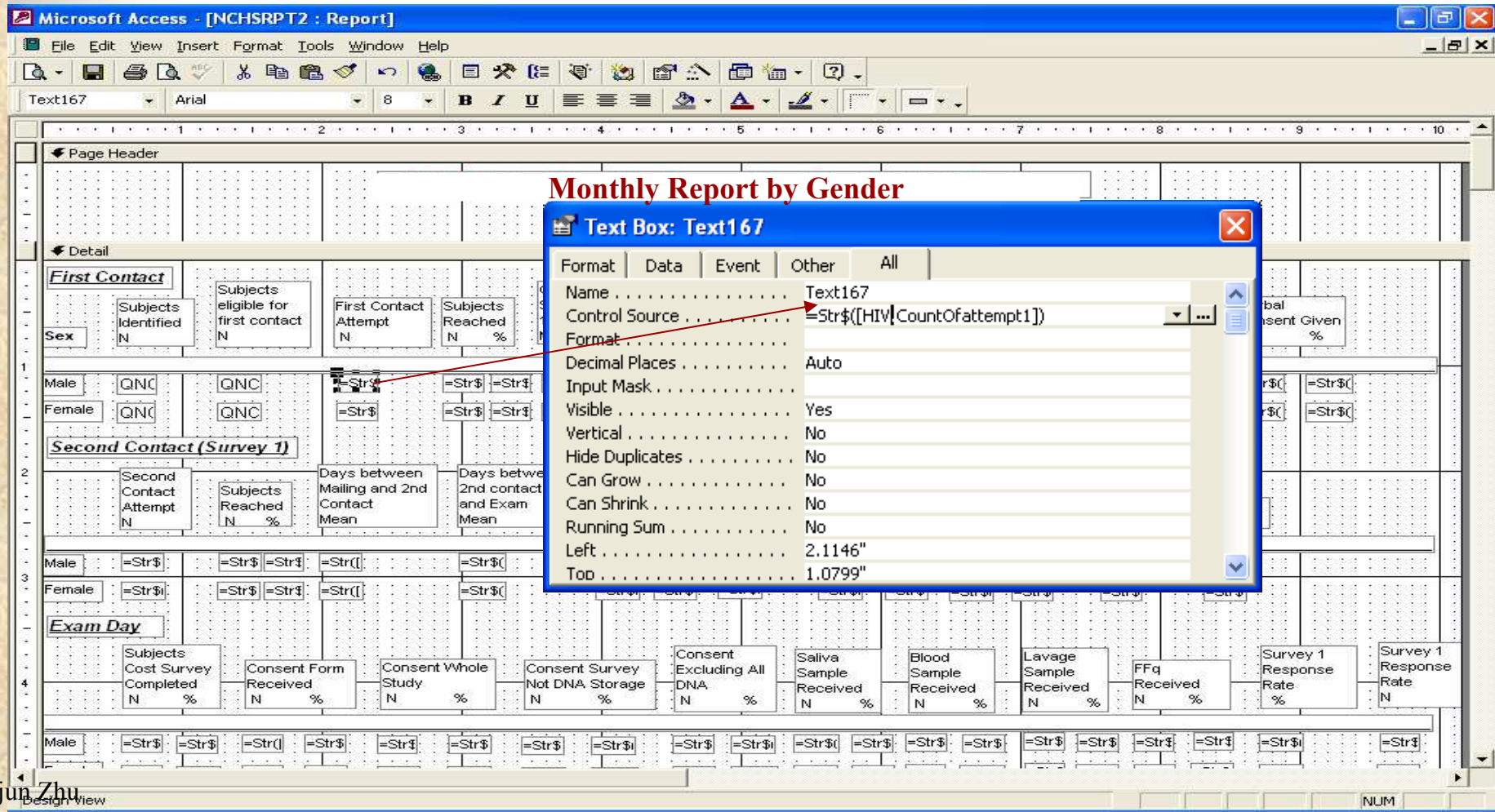
Visualizing the data

10. Laying out the chart's data elements
11. Click Ok, next, and finish
12. Resize the graph
13. Switch to Form view

- Which HAART medications were working better (boost the immune system)?



Interim data analysis -- reports



Working on the report

- Tips for building a good report:

1. Have a general idea of your report layout.
2. Assemble the data needed for the report.
   - ✓ A single database table.
   - ✓ From the results of a query dynaset.
   - ✓ Link many tables with a query and then use the results of the query.
3. Use Expression to perform a calculation, manipulating characters, or test data.
   - Types of Expression
     - ✓ Operator: >, *, And, Or, Not, Like, and so on.
     - ✓ Object (identifiers) names: Form!(frmtest).
     - ✓ Function: Date(), DateDiff().
     - ✓ Literal value: 100, Jan. 1, 2003.
     - ✓ Constants: Yes, No, Null, True, False.

Other Features

- Programming in Visual Basic
- Password protected databases
- ODBC connections to large databases or other files
- Replication
- And more ...

Wrapping up

- Access is good for
  - Small to medium size database
  - Most are Windows teams
  - Front ends to more complicated database (go online, network, etc.)
  - Running your study without any financial burdens

Resources

Book:

- Access 2003 Bible
- Microsoft Office Access 2003: the complete reference
- Absolute beginner's guide to Microsoft Office Access 2003
- Microsoft Office Access 2003 Step By Step
- Microsoft Office Access 2003: professional results