

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

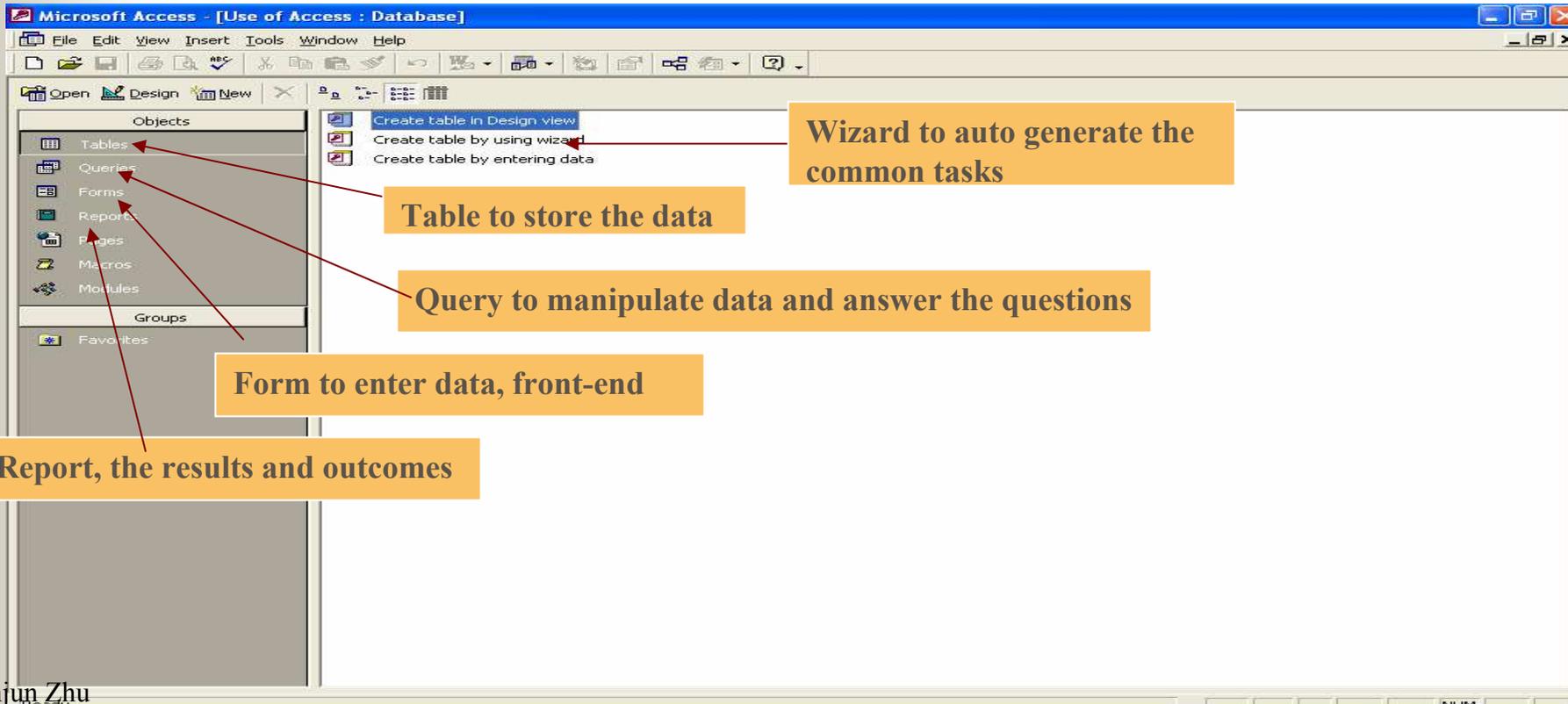


Objectives

- 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...)

Microsoft Access - [Parent_2004_HIV_active_patients : Table]

File Edit View Insert Tools Window Help

Field Name	Data Type	Description
idnum	Text	
Doctor	Text	
First_date_visit	Date/Time	
New pt	Yes/No	
test_date	Date/Time	
p_last_name	Text	
p_first_name	Text	
p_middle	Text	
dob	Date/Time	
gender	Text	
ethnicity	Text	
Race	Text	
elisa	Text	
First_date_HIVTest_Positive	Date/Time	
death	Date/Time	
Inactive	Text	
Date_inactive	Date/Time	
wb	Text	
comments	Memo	
Insurance	Text	
Phone1	Text	
Phone2	Text	
SSN	Text	
enroll_date	Date/Time	
date_visit_year	Date/Time	

Field Properties

General | Lookup

Field Size: 9

Format:

Input Mask:

Caption:

Default Value:

Validation Rule:

Validation Text:

Required: No

Allow Zero Length: No

Indexed: Yes (No Duplicates)

Unicode Compression: Yes

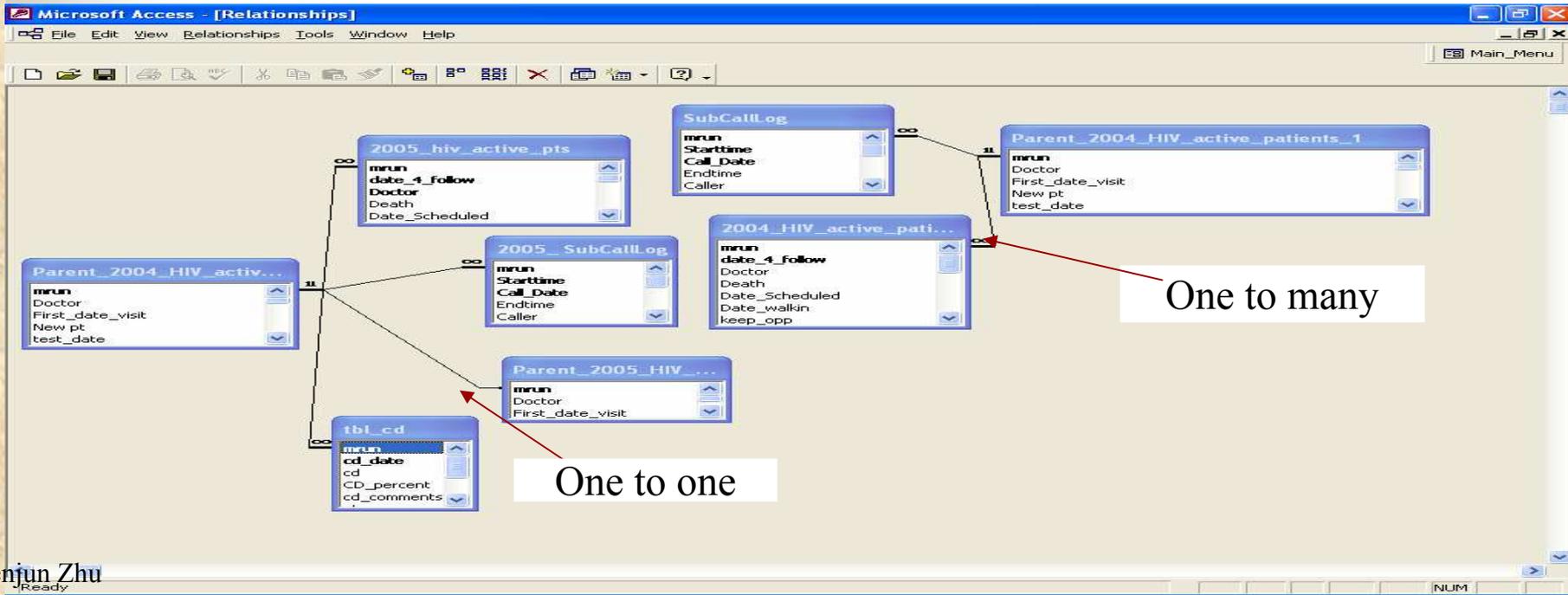
A field name can be up to 64 characters long, including spaces. Press F1 for help on field names.

Design view. F6 = Switch panes. F1 = Help.

NUM

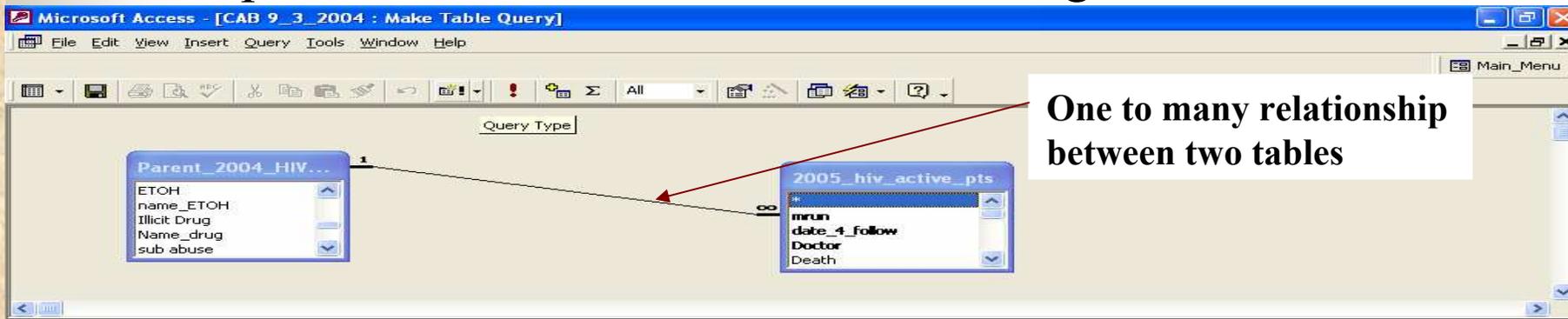
Relationships between tables

- 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



One to many relationship between two tables

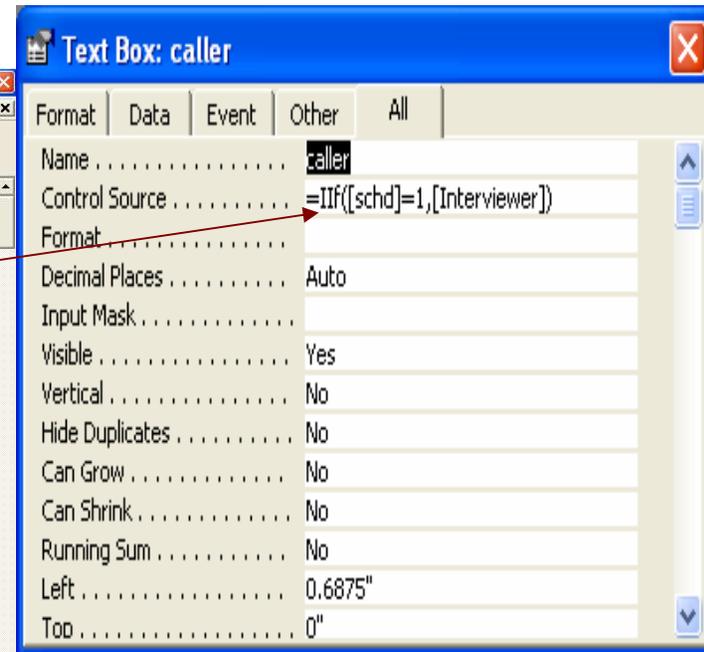
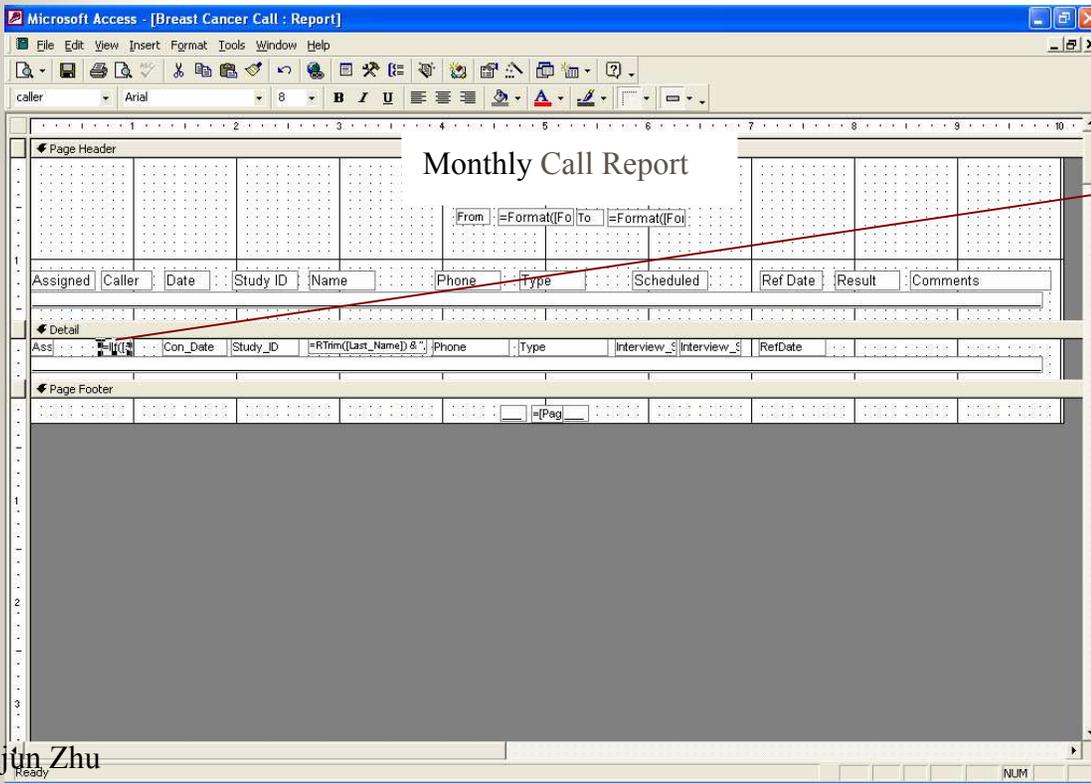
Field:	mrun	p_last_name	p_first_name	dob	gender	Race	age: (Now()-[dob]),		
Table:									
Sort:	Ascending								
Show:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
Criteria:				>#12/12/1964#	"1"	"2"			
or:									

Criteria: select DOB after "12/12/1964" or "gender is Male" or "Race is Asian"

Calculated filed age: = (today date - [DOB])

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

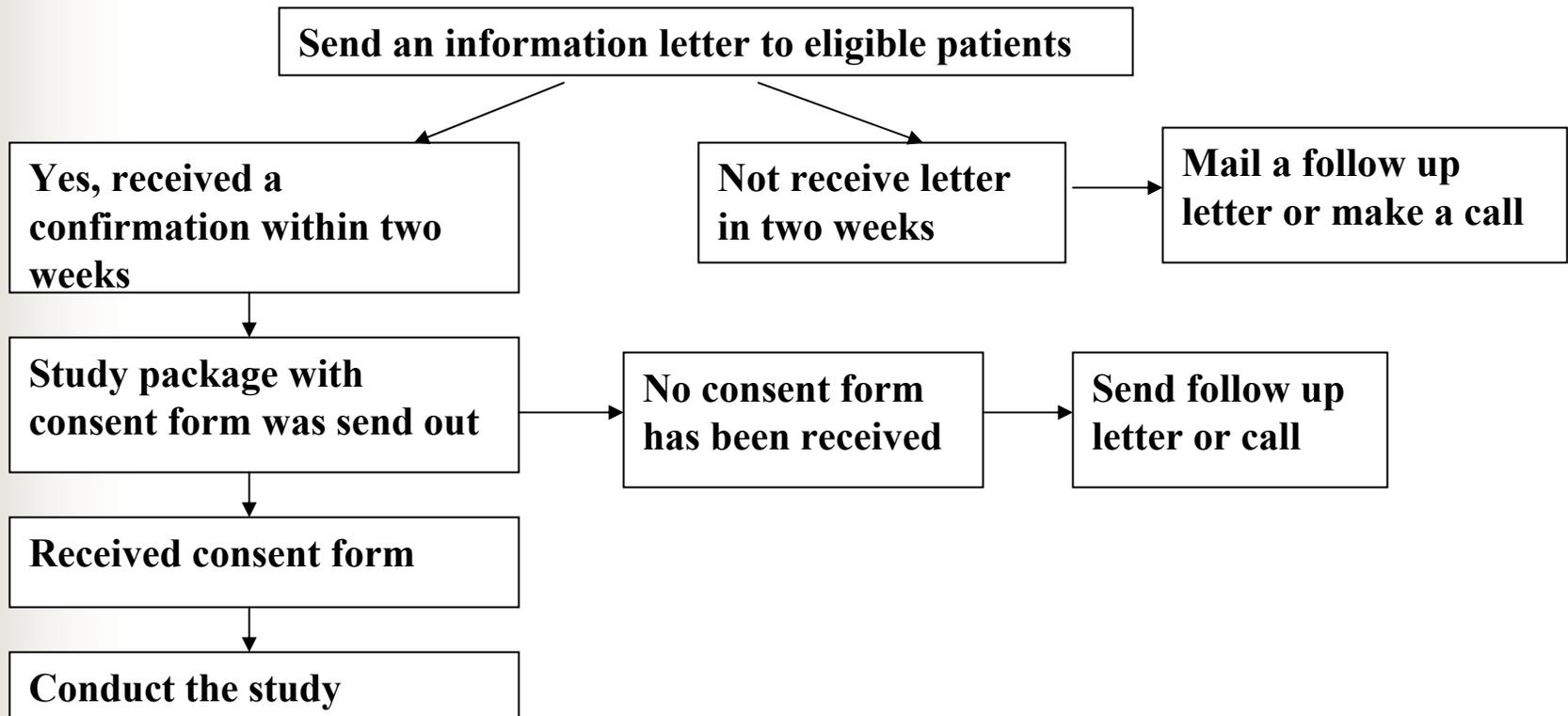
A case-control HIV clinical trial study:

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 (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

Microsoft Access - [letter : Select Query]

Microsoft Access - [useofAccess : Database]

1. Query in Design View

2. Show table screen

3. Drag and drop the fields you want to use in the letters

tblClinical

*
Study_ID
Last_Name
First_Name
Middle_Name

Field: Iname Left

Table:
Sort:
Show:
Criteria:
or:

UseAccess

OK
Cancel
Select All
Deselect All
Options >>

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

1. Insert merge field

2. Select the fields from insert merge

3. Start mail merge

Microsoft Word - Patient Recruitment Letter - Microsoft Word

File Edit View Insert Format Tools Table Window Help

Normal Times New Roman 12 B U

Insert Merge Field Insert Word Field Merge...

May 16, 2005

«Lname», «Fname»
«street1»
«City», «street1» «ID»

A Research Study You May Be Interested In

Dear Mr. /s. Name:

Two researchers at Meharry Medical College and Vanderbilt University Drs. Shenn Zhu and Roberson Hard are studying HIV...

A review of your medical records suggests you might be eligible to participate in this study. Participation will involve (a) being randomly assigned to receive (b) being randomly assigned to take an experimental medication (c) spending two weeks in bed at the Clinical Research Center, Meharry Medical College having blood drawn every three hours. Study participation will last for two years and will involve at least three visits to the researchers' office.

If you may be interested in participating in this study or have questions, please call Dr. Zhu, Shenn at 615-xxxxxx. No one will call you about the study unless you call him or her first.

Participating in research is voluntary. It won't affect your treatment at GCRC, Vanderbilt University/ Meharry CRC, if you decide not to call about the study or decide not to participate.

Sincerely,

Page 1 Sec 1 1/1 At 5" Ln 22 Col 89

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.

Microsoft Access - [UseAccess1]

File Edit View Insert Format Records Tools Window Help

Tahoma 9 B I U

Study Recruitment Log

Wednesday, May 24, 2005

Eligibility?

1st letter sent out?

1st letter Received?

Study package sent out?

Consent form received?

	Eligibility	Letter Sent Date	Letter Receive Date	Package sent	Cons Receiv
TN 216 () -6152	1	8/9/2001	8/29/2001	9/6/2001	10/15/2001
TI		8/9/2001	8/29/2001	9/6/2001	
TI				9/9/2002	
TN 211			5/15/2001	7/13/2001	
TN 211				5/8/2002	
TN 115			8/29/2001	9/6/2001	
TN 072					
TN 172 () -6155	1			6/18/2002	
TN 172 () -6155				8/21/2002	9/20/2002
TN 172					
TN 115 () -6152				3/2002	5/17/2002
TN 066 () -6152				5/6/2002	5/20/2002
TN 221 () -6152	2	7/23/2001	7/24/2001		
TN 209 () -6152				10/2001	8/6/2002
TN 036 () -6157					
TN 122 () -6157				2/2001	5/17/2001
TN 075 () -6158				2/2001	6/21/2001

Record: 1 of 688

Form View

Monitor your core study data

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

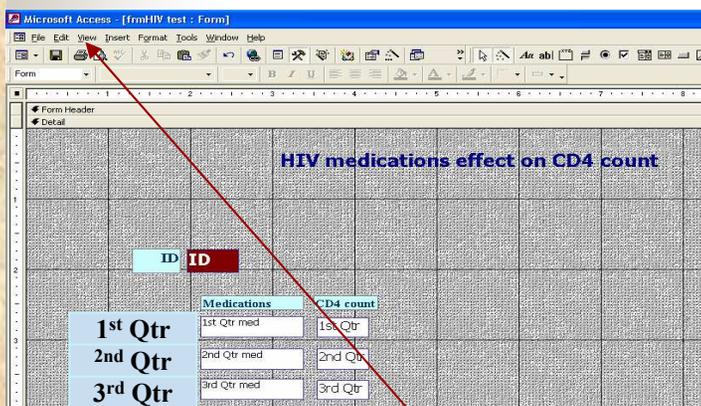
The screenshot shows a Microsoft Access form titled "HIV medications effect on CD4 count". The form is in Form View and displays a table with the following data:

	Medications	CD4 count
1 st Qtr	COM, Viread	320
2 nd Qtr	COM, Kaletra	450
3 rd Qtr	Viread, Kaletra, AZT	400
4 th Qtr	Viread, Kaletra, AZT	384

The form also includes an ID field with the value 1. The status bar at the bottom indicates "Record: 1 of 291" and "Form View".

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



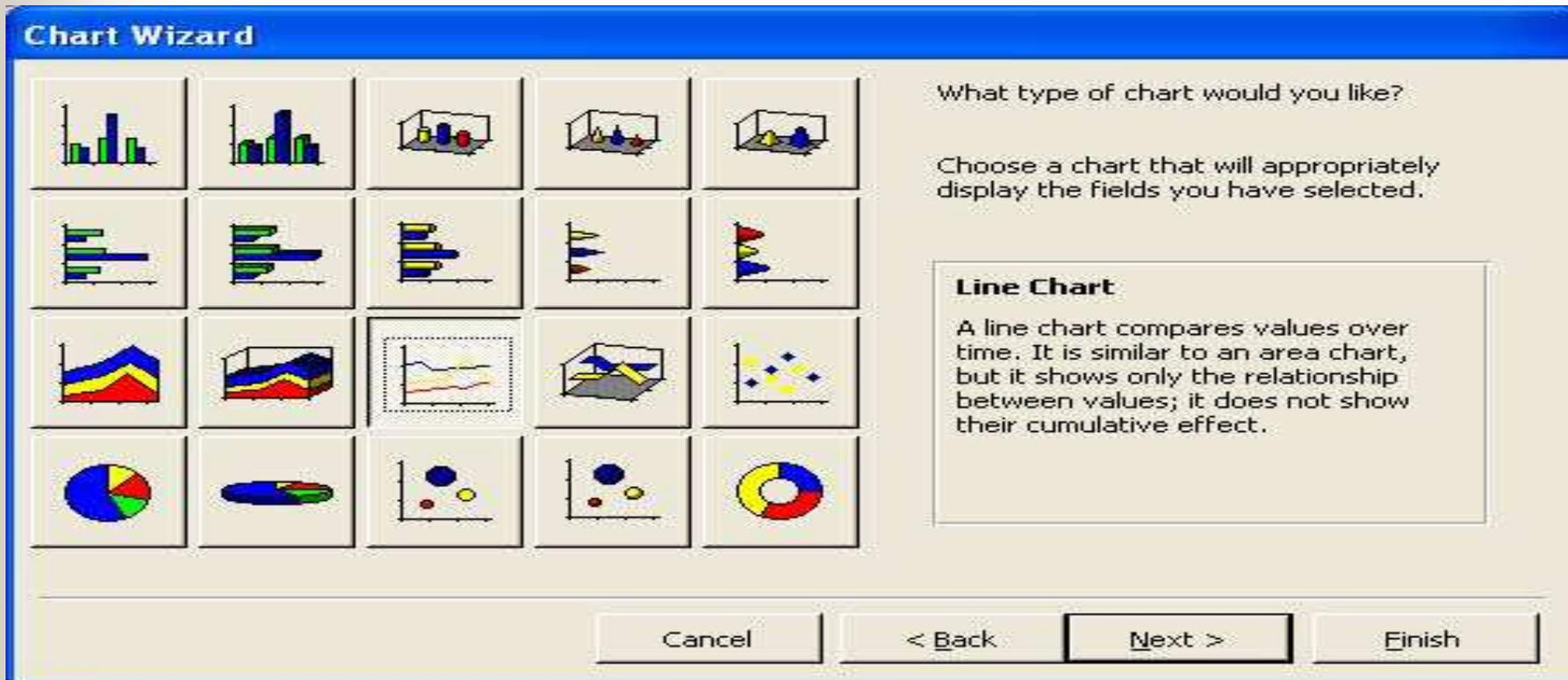
1. Select Chart from the insert menu



2. Wizard screen to select

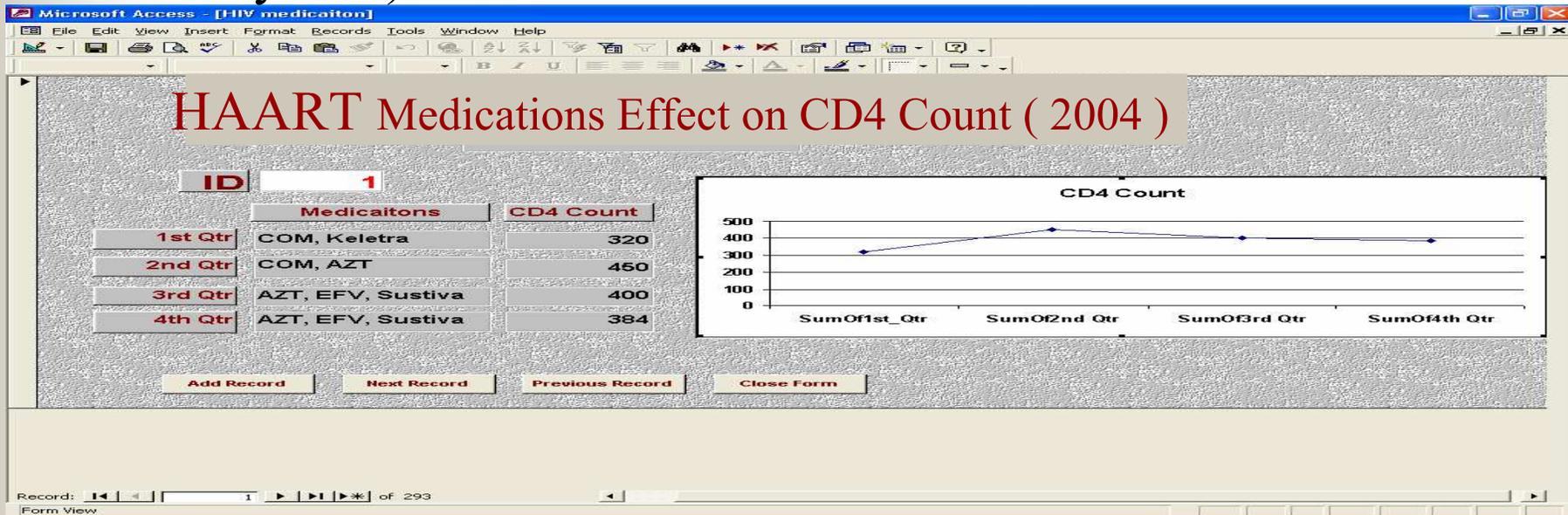
Add the graph to the form (cont'd)

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

The screenshot displays the Microsoft Access interface for a report named "Monthly Report by Gender". The report is in Design View, showing a grid of controls for different sections: "First Contact", "Second Contact (Survey 1)", and "Exam Day". A text box control, "Text167", is selected, and its property sheet is open. The "Control Source" property is set to the expression `=Str$([HIW]CountOfattempt1)`. The "Text" property is set to `2.1146"` and the "Text Box" property is set to `1.0799"`. The background report grid shows various data fields and their calculated values for Male and Female subjects.

Section	Field	Male	Female
First Contact	Subjects Identified	QNC	QNC
	Subjects eligible for first contact	QNC	QNC
	First Contact Attempt	=Str\$	=Str\$
	Subjects Reached	=Str\$	=Str\$
Second Contact (Survey 1)	Second Contact Attempt	=Str\$	=Str\$
	Subjects Reached	=Str\$	=Str\$
	Days between Mailing and 2nd Contact	=Str\$	=Str\$
	Days between 2nd contact and Exam	=Str\$	=Str\$
Exam Day	Subjects Cost Survey Completed	=Str\$	=Str\$
	Consent Form Received	=Str\$	=Str\$
	Consent Whole Study	=Str\$	=Str\$
	Consent Survey Not DNA Storage	=Str\$	=Str\$
	Consent Excluding All DNA	=Str\$	=Str\$
	Saliva Sample Received	=Str\$	=Str\$
	Blood Sample Received	=Str\$	=Str\$
	Lavage Sample Received	=Str\$	=Str\$
	FFq Received	=Str\$	=Str\$
	Survey 1 Response Rate	=Str\$	=Str\$
	Survey 1 Response Rate	=Str\$	=Str\$



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

