

Data, Data Everywhere....



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DISCLOSURE

I have no actual or potential conflict of interest in relation to this program or presentation.

Abundance of clinical data



Diligent data entry

- ◆ Quality improvement
- ◆ State/national mandate
- ◆ Billing/coding



Patients and data yield research ideas



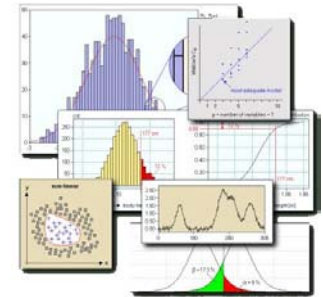
“We are charting clinical data anyway so why not put it in a database?”

“The data exists so why not analyze it?”

As the saying goes....



Data, entry, & analysis don't always flow



Not everything is as easy as it seems



UMass Trauma Registry

- ◆ 20+ years
- ◆ Prospective data collection
- ◆ Demographic, clinical, and outcome variables
- ◆ >40K records
- ◆ Ready for analysis and publication
- ◆ Not utilized previously for lack of time

UMass Trauma Registry

TRAUMA SERVICE ABSTRACT SHEET

Last Name: _____ Date Reviewed _____ CDU E/D* _____

CIM _____ Date Entered _____

TRIAGE				DEMOGRAPHICS			
Hosp Arrival date:	///	Last Name	_____	Last Name	_____	Street	_____
Hosp Arrival time:	_____	First Name	_____	First Name	_____	City	_____
Category Level:	1 2 3 4	DOB/Age	///	DOB/Age	///	City	_____
Notified/Response:	_____	Gender	M F	Gender	M F	State	_____
TS Attending:	TE BS NK UT	Race	_____	Race	_____	Zip	_____
Covering attending:	_____	Ethnicity	_____	Ethnicity	_____	Country	_____
Admit Service:	_____	SS#	_____	SS#	_____	Country	_____
Consult:	_____	FINANCIAL INFORMATION					
Notified:	_____	Medicaid	_____	Private	_____	Worker's Comp	_____
Rsp time:	_____	Not billed	_____	No fault Auto	_____	BC/BS	_____
Med Record#:	_____	Self-pay	_____	Medicare	_____	Other	_____
Account#:	_____	Other Gov't	_____	Other Gov't	_____		_____
INJURY EVENT				TRANSPORT MODE			
Injury Date:	///	Land	_____	Helicopter	_____	Private	_____
Injury Time:	__:	PRE HOSP (EMS)	_____	Scene EMS	_____	Referral EMS	_____
Injury City:	_____	Run Sheet Available:	Y N	Y N	_____	Y N	_____
Injury State:	_____	Agency:	_____	Agency:	_____		_____
Injury Zip:	_____	Transport Mode:	ALS BLS	ALS BLS	_____	ALS BLS	_____
Injury Country:	_____	Dispatch Date:	///	///	_____	///	_____
Work Related?:	Y N	Dispatch Time:	__:	__:	_____	__:	_____
Industry:	_____	Scene Arrival Date:	///	///	_____	///	_____
Occupation:	_____	Scene Arrival Time:	__:	__:	_____	__:	_____
Mechanism:	B P Burn	Scene Depart Date:	///	///	_____	///	_____
Primary E-code:	E	Scene Depart Time:	__:	__:	_____	__:	_____
Cause Code:	_____	Time @ Destination:	__:	__:	_____	__:	_____
Details:	_____	Destination Facility:	_____	_____	_____	_____	_____
	_____	Referring Facility	_____	_____	_____	_____	_____
	_____	Discharge Date	___/___/___	___/___/___	_____	___/___/___	_____
Injury Location:	_____	Co-Morbidities					
Protective Device	_____	_____	_____	_____	_____	_____	_____
Child Restraint	_____	_____	_____	_____	_____	_____	_____
Air Bag	_____	_____	_____	_____	_____	_____	_____
ETOH?	N (not suspected) N (tested)	Y (trace levels) Y (beyond legal)	Drug Use?	N (not suspected) N (tested)	Y (Rx drug) Y (illegal drug)		
Patient Room Locations							
Unit#	IN time/date	OUT time/date	Dispo	Unit#	IN time/date	OUT time/date	Dispo

Trauma Registry 5/10

TRAUMA SERVICE ABSTRACT SHEET

	Time Date	SBP	Pulse	Resp rate	Asst rate	GCS Eye	GCS verbal	GCS motor	GCS total	O2 SAT	Temp °C
Scene											
Amb											
E/D											
O2 given:	Y	N	GCS Qualifier:	Innabated	Sedated	Eye obstruction					
RADIOLOGY (All Initial Diagnostic Studies)											
*Record date/time to initial CT only: ___/___/___											
Study	Body Part	Results (+/-)	Study	Body Part	Results (+/-)						
ALL PROCEDURES -Invasive and blood bank products											
Procedure	Descript	Location	Start time/date	Procedure	Descript	Location	Start time/date				
ICD-9	DIAGNOSIS	AIS	COMPLICATIONS/ SI								
ORGAN PROCUREMENT INFO											

Trauma Registry 5/10

Patient Quality and Outcomes Research Tools

A New Paradigm in Trauma Registry

Introducing TraumaBase 7.0

*A revolutionary revision in Trauma Registry Software.
Making the most of technology
while remaining true to the day-to-day rigors
of the Trauma Registry professional.*

Often imitated but never surpassed!

Once again, TraumaBase with Version 7.0
raises the bar to which all other registries can only hope to



Early research plans

- ◆ Three study questions
- ◆ Three abstracts/manuscripts by end of year
- ◆ Facilitate research by colleagues using same data

Some examples of what I found



Data, data everywhere....

- ◆ Examine mortality patterns

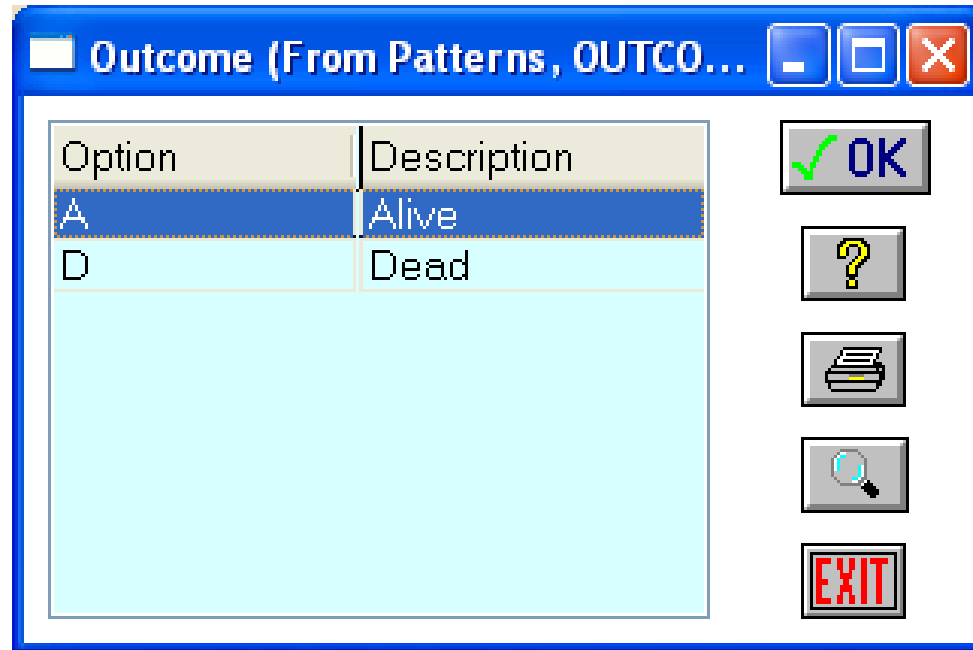


....Not a drop can be analyzed

◆ Mortality variable?



Trauma Registry Outcomes Screen



Generate new variable = Died

Died = 1 if outcome = D

Died = 0 if outcome = A

Data, data everywhere....

- ◆ Adjust for co-morbidities



....Not a drop can be analyzed

◆ Co-morbidity variable



Trauma Registry Co-morbidities Screen

Option	Description
BACK	Backseat passenger
CALIBER	Caliber of bullet
DASH	Dashboard damage
DEFORM	Major external vehicle damage
EJECT	Ejected out of enclosed vehicle
FATAL	Death of same car occupant
FRONT	Front seat passenger
HEIGHT	Height of fall (in feet)
MED	Medical problems: MI;CVA;COPD;cancer;diabetes
PEDES	Speed of vehicle which struck pedestrian
PREG	Pregnancy
ROLL	Vehicle Rollover
SELF	Self inflicted injury
SPEED	Vehicle speed (not pedestrian injuries)
STEER	Steering wheel damage
THROWN	Distance thrown (pedestrian;bicyclist;motorcyclist)
TRAP	Extrication time (in minutes)
WIND	Windshield damage: "starring"
Angina p	History of angina within past 4 months
Ascites	Ascites within 30 days
Bleeding	Bleeding disorder
Chemo	Chemotherapy for cancer within 30 days
Congenital anomalies	Congenital anomalies
Congestive HF	Congestive heart failure
CVA w/deficit	CVA with residual neurological deficit

Data, data everywhere....

- ◆ Abbreviated Injury Scale (AIS)
 - Standardized injury terminology
 - Facilitate comparisons of injury studies
 - Rank injuries by severity
 - Describe injuries anatomically



....Not a drop can be analyzed

AIS Region	
Head/Neck	Includes C-spine
Face	Facial skeleton, nose, mouth, eyes, ears
Chest	Included T-spine and diaphragm
Abdomen	Includes pelvic contents and L-spine
Extremities	Includes pelvic skeleton
External	Abrasions, contusions, superficial injuries

AIS Code	Injury
0	Not Injured
1	Minor
2	Moderate
3	Serious
4	Severe
5	Critical
6	Fatal
9	Not further specified

Trauma Registry AIS Body Region Screen

Body Region (From Patterns, REGION) <AREA >

Code	Description
9	Unspecified
ABD	Abdomen/PMC Contents
ARM	Upper Extremities
CHEST	Thorax
CS	Cervical Spine
EXT	External
FACE	Face
HEAD	Head
LEG	Lower Extremities
LS	Lumbar Spine
NA	Unspecified
NECK	neck
SPINE	Spine Unspecified
TS	Thoracic Spine
UNSPEC	Unspecified

OK ? Print Search EXIT

Data, data everywhere....

◆ Transplant procurement



....Not a drop can be analyzed

◆ Organs donated variable



Trauma Registry Organs Donated Screen

These are the organs that were donated by the pat...

Option	Description
BATH	Bathing
BEHAVE	Behavior
BRRAIN	BRRAIN
COG	COGNITION
COM	COMMUNICATION
CORNEA	CORNEA
DIET	DIET
DRESS	DRESSING
EARBONES	Ear bones
EXP	EXPRESSION
FEED	FEEDING
HEAR	HEARING
HEART	HEART
HL	HEART AND LUNGS
KIDNEY	KIDNEY
LIVER	LIVER
LOC	LOCOMOTION
MARROW	BONE MARROW
MS	MUSCULOSKELETAL
OTHER	OTHER ORGAN DONATION
PANCREAS	PANCREAS
SKIN	SKIN
SPEECH	SPEECH
SPINE	SPINAL CORD
VIS	VISION

OK ? Print Search Filter Help Exit

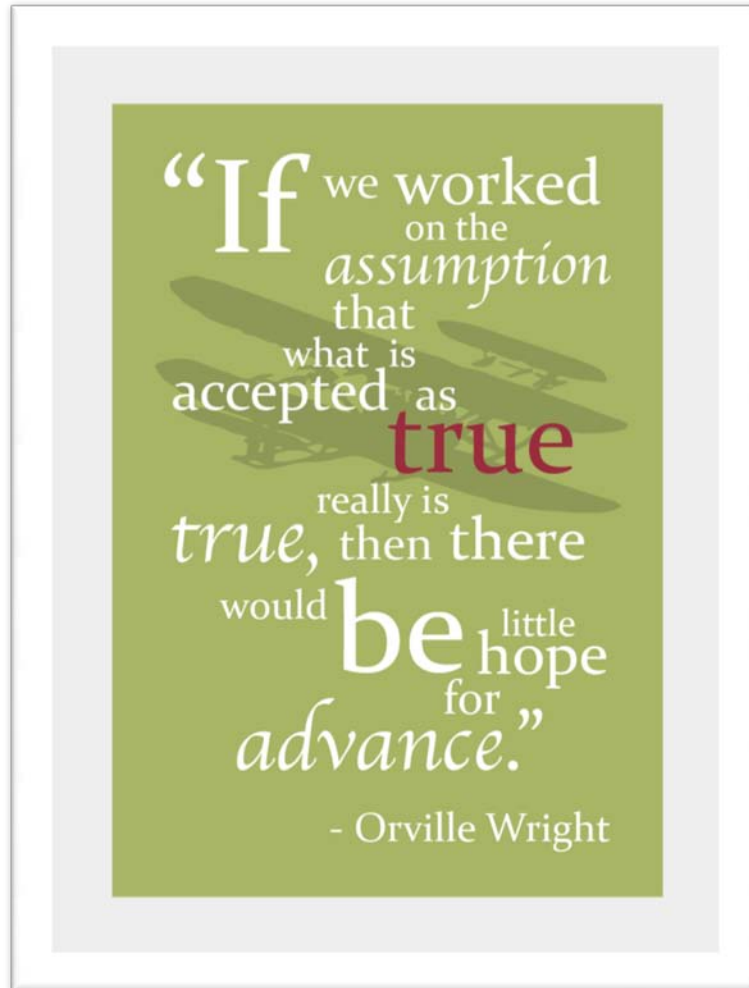
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OK ? Print Search Filter Help Exit

Research with clinical data



“Do not assume that recorded data is suitable for research.”

Issues

◆ Variables

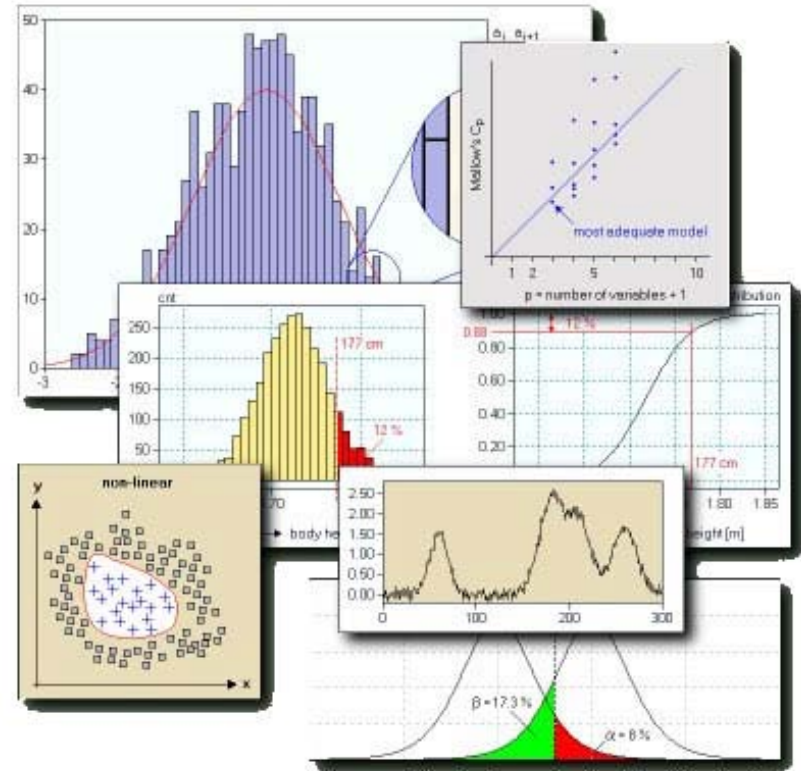
- Unclear names
- Applicable to more than one true measure
- Unnecessary data

◆ Values

- Too much free text
- Inconsistent coding across variables
- Unclear
 - Missing vs. unknown
 - Not applicable vs. missing
- Non-numeric coding

A variable's future

“How will each variable and associated values be represented in a pie chart, bar graph, or statistical model in the future?”



Recommendations

◆ Variables

- Define narrowly
- Avoid overlap (collinearity)
- Use dummy variables (1/0)

◆ Data dictionary

- Variable/Value
- Creation date

◆ Values

- Numeric
- Used consistently across database
- Rarely free text
 - “other” value
- Specify codes for missing vs. unknown vs. not-applicable

Road to successful research



Thank you

