Challenges with Data Driven Metrics for Space Planning

Pam Bounelis, PhD
National Chair Elect, AAMC Group on Institutional Planning
University of Alabama at Birmingham
Association of American Medical Colleges

Members
- 145 accredited US medical schools
- 17 accredited Canadian medical schools
- ~400 teaching hospitals/health systems including
  - >50 VA medical centers
  - >80 academic societies

 Represents
- 148,000 faculty
- 83,000 medical students
- 115,000 resident physicians
### Types of Data

- Medical school revenues
- Faculty and student demographics
- Compensation comparisons
- Ad hoc data requests

### Compensation by Department, PhD Faculty, Combined Ranks

<table>
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<tr>
<th></th>
<th>FY15</th>
<th>FY14</th>
<th>FY13</th>
<th>% Change FY14-FY15</th>
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<td></td>
<td>Mean</td>
<td>Median</td>
<td>Mean</td>
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<td><strong>All Basic Sciences</strong></td>
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<td>131.9</td>
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<td></td>
<td>129.3</td>
<td>117</td>
<td>129.4</td>
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<td><strong>Pharmacology</strong></td>
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<td>119</td>
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<td></td>
<td>129.4</td>
<td>117</td>
<td>129.4</td>
<td>117</td>
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Source: [AAMC Faculty Salary Survey Report, Table 33](https://www.aamc.org/data/data-access/faculty-salary-survey), accessed 01/27/16
AAMC Programs and Publications

**Programs**
- Leadership programs
- Mentoring programs
- Meetings on specific topics
- Seminars and webinars

**Publications**
- Academic Medicine
- Analysis in Brief
- Washington Highlights
- Special reports

*Coming in March*

**Leadership Guide for Department Chairs**

*Executive Development Seminar for Aspiring Leaders*
April 28-30, 2016, AAMC Learning Center, Washington, D.C.

*Being a Resilient Leader*
April 1-2, 2016  
[more information](#)
AAMC Group on Institutional Planning

Mission: “to advance the discipline of planning in academic medicine by enhancing the skills and knowledge of professional planners; to promote the value of planning; and to connect people, resources, and ideas.”

- Diverse membership
- Active listserve
- Sponsor symposia, workshops, and webinars
- Provide data and resources
  - Sustainability
  - Strategic planning
  - Emergency planning
What We Wanted to Learn

• Should our expectations (metrics) be the same for “wet” vs. “dry” research spaces?
• Are there comparative space metrics available?
• What components are included in comparative space metrics?
Why Does This Matter to Us?

• Improves decision-making to support priorities
  – Renovate, reuse, re-allocate
  – Build, rent
  – Sell, lease, demolish

• Improves resource utilization
  – Support research programs, faculty, trainees
  – Reduce costs

• Promotes transparency and fairness
  – Setting expectations
Why Might This Matter to You?

• You probably have authority and responsibility
• Supports transparency and equity
  – Setting expectations for faculty
  – Comparisons to other departments
• Improves negotiating ability
  – Recruits
  – Dean’s office
• Promotes stewardship and sustainability
Hypothesis 1

Space dollar densities are calculated similarly at different schools
Our GIP Subcommittee Approach

Talk → Survey → Talk → Survey → Talk → Read → Idea

Eric W Boberg, PhD
Executive Director for Research
Northwestern University
Feinberg School of Medicine
What We Learned: Different Types of Space Metrics In Use

• Dollar density: 
  *surrogate measure for activity*
  – Awards/ net square feet
  – Indirect expenses/square feet

• People density: 
  *surrogate measure for occupancy*
  – FTE/net square feet
  – Person per kneehole/desk
What We Worry About: Internal Misalignment in Dollars and NSF

Multi-Investigator Awards
- Misalignment: 5
- Aligned: 5

Clinical Research
- Misalignment: 4
- Aligned: 6

Centers or Institutes
- Misalignment: 6
- Aligned: 3
Eric’s Idea: If We All Have the Same Data, Will We Use It the Same Way?

• Created a fictitious department of 10 faculty
• Each faculty described in terms of:
  – Personnel
  – Grant awards
  – Expenditures
  – Assigned space
  – Shared space
• Participants asked to calculate space utilization value based on current practices
# GIP Data & Information Subcommittee Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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<tbody>
<tr>
<td>Eric Boberg, PhD</td>
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<tr>
<td>Pam Bounelis, PhD (Chair)</td>
<td>University of Alabama at Birmingham</td>
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<tr>
<td>Matthew Darring</td>
<td>University of Virginia</td>
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<tr>
<td>Scott DeBlaze</td>
<td>University of Chicago, Pritzker</td>
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<td>Mary Ann Guida</td>
<td>Columbia University</td>
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<tr>
<td>Denise A. Johnson</td>
<td>Saint Louis University</td>
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<tr>
<td>Sucheta Kulkarni</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Lynn K. Meaney</td>
<td>University of Pennsylvania, Perelman</td>
</tr>
<tr>
<td>Gregory Robinson</td>
<td>University of Maryland</td>
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<tr>
<td>Jerome Sak</td>
<td>University of California San Francisco</td>
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<tr>
<td>Niki Smith</td>
<td>Vanderbilt University</td>
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<tr>
<td>Jill Stanley</td>
<td>Case Western Reserve University</td>
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<tr>
<td>Rebecca Waltman</td>
<td>University of Iowa</td>
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<tr>
<td>Kim Reed and Heather Sacks</td>
<td>AAMC GIP Staff</td>
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<td>Hypothesis</td>
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<tr>
<td>1</td>
<td>Space dollar densities are calculated similarly at different schools</td>
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<tr>
<td>2</td>
<td>Using the same data, Schools will calculate similar or identical $/nsf values</td>
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Faculty 1: Lab-Based

People:
3 students, 1 postdoc, 1 lab tech

Funding:
2 NIH R01s ($250K direct each + F&A)
American Heart Association Award ($100K direct + 10% F&A)

Expenditures:
$540K direct
$490K MTDC

Space (nsf): (2,680 assigned, 190 other)
2,000 assigned lab
  300 assigned lab service
  280 assigned office
  100 assigned animal housing
  50 share of common lab space
  140 share of department admin
Faculty 1: Lab-Based
(range = $99 to $325/nsf)

People:
3 students, 1 postdoc, 1 lab tech

Funding:
2 NIH R01s ($250K direct each + F&A)
American Heart Association Award ($100K direct + 10% F&A)

Expenditures:
$540K direct
$490K MTDC

Space (nsf):
2,000 assigned lab
300 assigned lab service
280 assigned office
50 share of common lab space
140 share of department admin
100 assigned animal housing

Productivity Metric ($/nsf)

SOM
What Is Contributing to the Variability?

• Types of dollars counted in the measurement
  – Total, direct dollars or indirect dollars
  – Different F&A rates
  – Expenditures vs awards

• Types of spaces counted in the measurement
  – Assigned vs shared
  – Animal housing
  – Lab service areas
Variables in Numerator ($/nsf)

- Total Awards
- Direct Expenditures
- MTDC Expenditures
- MTDC + Indirect Expenditures

(n=8 SOMs)
Hypothesis 1: Space dollar densities are calculated similarly at different schools.

Hypothesis 2: Using the same data, Schools will calculate similar or identical $/nsf values.

Hypothesis 3: Space dollar densities calculated using MTDC Expenditures lead to similar or identical $/nsf values.
MTDC Expenditures

- *Includes* direct salaries, wages, fringe benefits, materials and supplies, services, travel, up to the first $25K of each subaward

- *Excludes* indirect costs, equipment, capital expenditures, patient care charges, rent, tuition remission, scholarships and fellowships, subaward costs >$25K
Recalculating Using MTDC Expenditures in Numerator of $/nsf Metric

- The mean $/nsf differs by ~$31/nsf
- Standard deviation decreases from $73.01 to $17.20

n=8 SOMs
Faculty 2: Epidemiologist

People:
4 data analysts, 1 data coordinator, 1 sample processing technician

Funding:
1 R01 ($250K direct + F&A)
10% salary on someone else’s award ($35K direct + F&A)

Expenditures:
$225K direct + F&A
$225K MTDC + F&A
$35K salary coverage + F&A

Space (nsf):
400 assigned lab
140 assigned PI office
120 assigned support office
300 assigned cubicles
140 share of department admin
Faculty 2: Epidemiologist  
(range = $198 to $650/nsf) 

People:  
4 data analysts, 1 data coordinator, 1 sample processing technician 

Funding:  
1 R01s ($250K direct + F&A)  
10% salary on someone else’s award ($35K direct + F&A) 

Expenditures:  
$225K direct + F&A  
$225K MTDC + F&A  
$35K salary coverage + F&A  

Space (nsf):  
400 assigned lab  
140 assigned PI office  
120 assigned support office  
300 assigned cubicles  
140 share of department admin
The mean $/nsf values are similar.

Standard deviation increases from $139 to $141/nsf.

Variability isn’t due only to numerator (dollars).

What are the contributing space variables?

n=8 SOMs
For “Dry Lab” Research, Space Types Included in $/nsf Denominator Are Variable

- PI office + support personnel offices + cubicles
- PI office + support office (no cubicles)
- PI office only (no support office or cubicles)
- None

(n=8 SOMs)
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<td>Calculations using MTDC expenditures will lead to similar/identical $/nsf values</td>
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<td>4</td>
<td>Calculations using the same space components will lead to similar or identical $/nsf values</td>
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Recalculating Using Either Constant Dollars or Constant Space

Space Utilization (Mean $/nsf + SD)

- **Faculty 1: Lab-Based**
- **Faculty 2: Epidemiologist**

![Bar chart showing space utilization for different scenarios and faculty types.](chart.png)
Fold Variation of Reported Values ($/nsf) for Seven Hypothetical Faculty

Note: Values of zero were excluded. Reported values as n= x of 8
Reasons for This Range of Variability

• Dollars (expenditures vs. awards)
• F&A rates differ between schools
• Included spaces – offices are problematic
• Misalignment of space and dollars
  – Some *exclude* clinical spaces but *include* dollars related to clinical research
  – Some *exclude* animal space but *include* the dollars for animal costs
Greater Fold Variation of Reported Values ($/NSF) for Other Faculty Phenotypes

Fold Variation of Reported Values (High Value/Low Value)

- Clinical Trialist: 10.0 (n=6)
- Research Educator (T32 only): 16.0 (n=7 of 8)
- Center Director: 18.3 (n=6)
- Overall Department: 10.5 (n=6)
What Is a 10-fold Difference?

1 ostrich egg vs. 2 chicken eggs

50 pound dog vs. 5 pound puppy

2-storey garage vs. 20-storey building
More Variables

• Sponsored instructional grants
  – T32s are not counted by all schools

• Centers
  – Dollars don’t line up with space for Centers
  – Some schools don’t include Center dollars or space as part of their current practice
Other Things We Learned

• Collaboration is important
  – but salary support on a collaborator’s project is not valued in space metrics

• Some set $/nsf expectations for early-stage investigators

• None included department admin space

• Some use more than one metric

• Space quality is known but not part of metric
Comparisons of “$/sf” across schools are meaningless (dangerous?) without a complete understanding of the methodologies used.

In other words, caveat utilitor! (let the user beware)
Recommendations for Internal Research Space Metric Discussions

• Dollars and spaces should align
  – Animal research and animal housing
  – Clinical trials and clinics
  – VA awards and VA space

• If you use a dollar/nsf metric, use MTDC expenditures
  – Expenditures are better than awards – reflects activity
  – Reduces variances due to F&A rates by different sponsors
  – Eliminates non-research expenditures, off-site, & one-time costs

• Numbers should be a starting point for discussion
Other Information to Consider

• Career trajectory of faculty – crystal ball
  – is s/he on the rise or not?
  – is there room to grow if even more successful?
  – would a space change help (others)?

• Others in the group
  – trainees, staff, visitors, collaborators

• Location, location, location
  – Are faculty near the equipment, people, services that they need for greatest success?

• Quality and physical layout
  – Does the assigned space support the program?
Layout Can Make a Difference in Metrics

Lab 1: 407 nsf

Lab 2: 465 nsf

~15% difference in $/nsf metric
No real difference in function
Other Considerations

• Are facilities, floors, and rooms being used well?
• Do areas support and accelerate discovery and high-impact work?
• Do areas pose risks to people or research?
• If collaboration is important, how should it be valued?
How Should Shared Facilities Track?

• Do core facility spaces track to a department and/or faculty member?
• If at the department - does managing a core unfairly impact $/nsf space density values?
• Should these track to the Dean’s office?
What About Team Science?

- Do financial expenditures, credit for awards, and/or space track to the leader or to team members?
  - Is faculty salary covered, or effort, on projects others lead valued?
  - Are metrics consistent with promotion or tenure policies?
  - Do metrics support faculty satisfaction goals?
Can we use our business systems to:

1. Know when space is not being used
2. Eliminate the stockpiles (old equipment)
3. Identify failing building components early
4. Eliminate on the job injuries from unsafe conditions
Final Thoughts

• Institutional assets should be used well.
• Metrics should inform decisions, but should not be a substitute for decisions.
  – Rigid use may lead to undesired, unintended messages.
• Other types of information should be used with metrics.
• Consistency reinforces transparency and a perception of fairness.
Acknowledgements

• Mary Ockenden
  Associate Vice President &
  Director Medical Center Space Planning
  University of Rochester

• Angela Souza
  Senior Director, Planning and Facilities
  The University of Arizona
  College of Medicine, Tuscon
How Can the GIP Work With You?

Join Us!

Coming in Fall, 2017 – Space Symposium