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Research Laboratory Space Productivity at U.S. Medical Schools: Comparing Operations Management Survey Responses in Fiscal Years 2018 and 2022

Measuring research laboratory space productivity is a practice employed by U.S. medical school facilities and space management professionals to monitor usage, enhance efficiency, align with organizational goals, and ensure optimal conditions for scientific research and innovation. Analyzing these data can be particularly useful, especially when medical schools can benchmark their space productivity against industry standards or peer institutions.

In 2020, the AAMC produced a similar data snapshot examining the reported direct and indirect expenditures of sponsored programs per net assignable square feet (NASF) of research/nonclass laboratory space. The data snapshot was published to enhance medical schools' capabilities to inform strategic decision-making. This 2024 data snapshot, based on fiscal year (FY) 2022 Operations Management Survey (OMS) data, presents updated space productivity benchmarks with side-by-side comparisons to the previous publication.

Methods

Data utilized for this snapshot were derived from responses submitted by 83 participating LCME-accredited, U.S. MD-granting medical education programs to the voluntary OMS for FY 2022. "Space productivity" is calculated by dividing the sponsored programs (i.e., grants and contracts) direct cost expenditures (DCE) and indirect facilities and administrative cost expenditures (F&A) recorded in medical school accounts by medical school NASF associated with research/nonclass laboratories and laboratory services, as reported on the OMS. The OMS also asked participants to report wet lab and dry/computational lab space separately. If reporting wet lab space and dry/computational lab space separately was not feasible, participants were asked to report total lab space (refer to glossary for lab space definitions).

As background, the 2020 data snapshot utilized FY 2018 OMS data. Additionally, federal research expenditures used to determine research intensity are based on direct federal grants and contracts expenditures for organized research as reported on the FY 2018 and FY 2022 LCME Part I-A Annual Financial Questionnaires, and include expenditures recorded and not recorded on the books of medical schools. Research intensity data are based only on medical education programs that participated in the FY 2018 or FY 2022 OMS.

Findings

Figure 1. Average U.S. medical school research laboratory expenditures per NASF, FY 2018 and FY 2022.

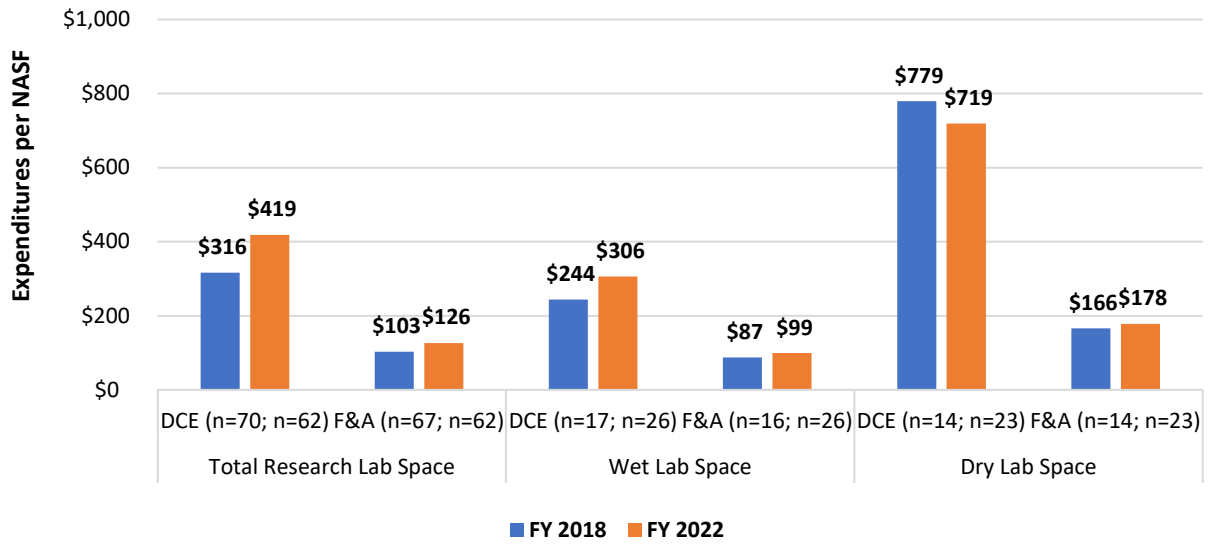

Figure 1 Takeaways:

- In the FY 2022 OMS, 53% (n=83/156) of eligible U.S. medical schools participated. Of these medical schools, 75% (n=62/83) reported DCE and F&A associated with research activities taking place in a nonclass research/laboratory space, and NASF.
- Total research lab space yielded $103 (or 33%) more in average DCE per NASF in FY 2022 than in FY 2018.
- In FY 2022, dry/computational lab space yielded $413 (or 135%) more in average DCE per NASF than wet lab space.
- As additional context, average reported DCE recorded in medical school accounts associated with activities that took place in the nonclass laboratory space increased 38% from FY 2018 to FY 2022, from $136 million to $187 million.

Figure 2. Average public U.S. medical school research laboratory expenditures per NASF, FY 2018 and FY 2022.

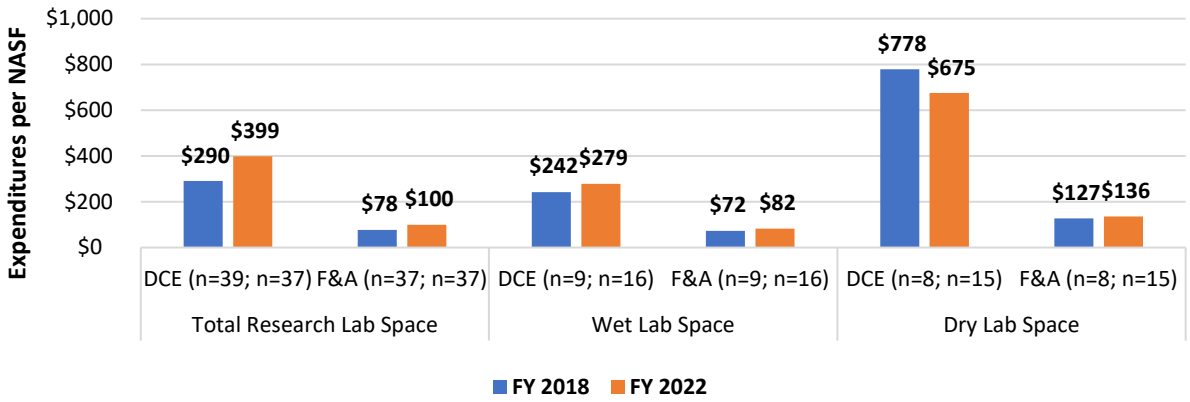

Figure 2 Takeaways:

- For public medical schools, laboratory research activities resulted in 37% more in average sponsored programs DCE per NASF in FY 2022 than in FY 2018.
- In FY 2022, for public medical schools, dry/computational lab space yielded an average $675 in sponsored programs DCE per NASF, 142% more in average DCE per NASF than wet lab space.

Figure 3. Average private U.S. medical school research laboratory expenditures per NASF, FY 2018 and FY 2022.

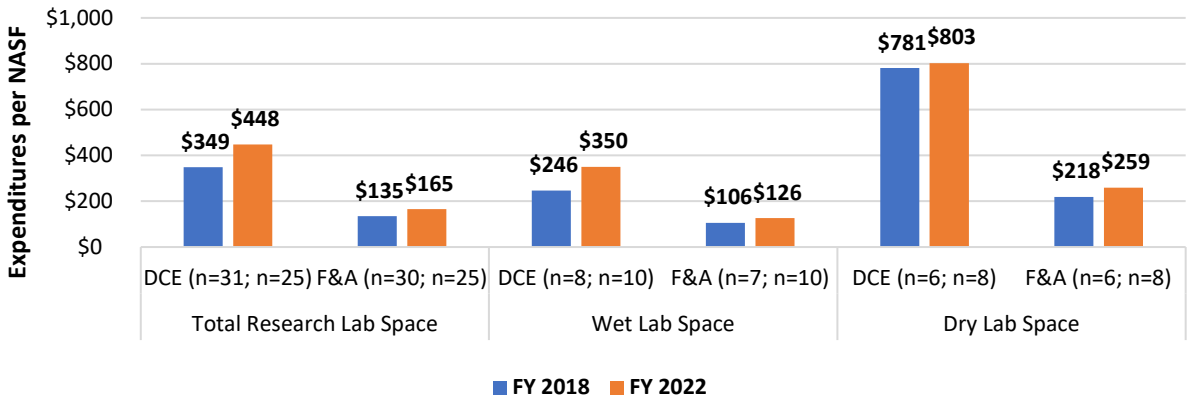

Figure 3 Takeaways:

- In FY 2022, for private medical schools, laboratory research activities resulted in 28% more in average sponsored programs DCE per NASF than in FY 2018.

- In FY 2022, for private medical schools, dry/computational lab space yielded an average of $803 in sponsored programs DCE per NASF, 129% more in average DCE per NASF than wet lab space. Additionally, dry/computational lab space at private medical schools reported 19% more in average DCE per NASF than public medical school dry/computational lab space.

Figure 4. Average direct cost expenditures per NASF and average NASF by research intensity, FY 2018 and FY 2022

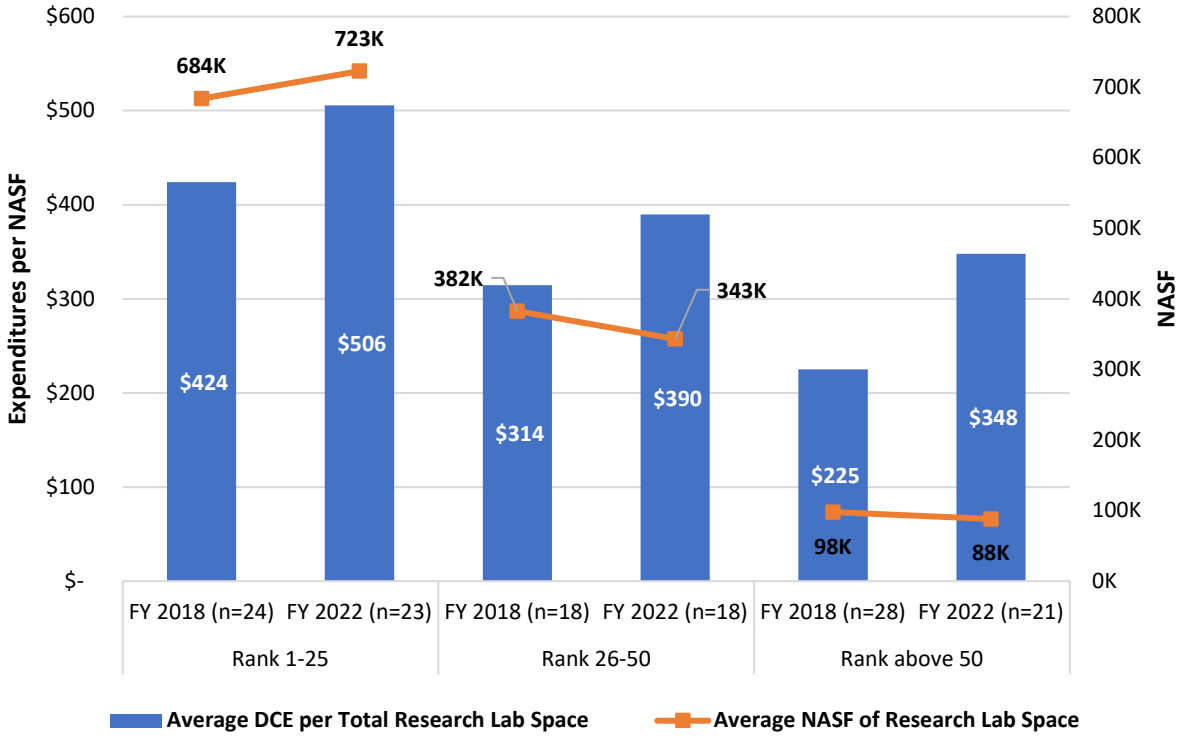

Figure 4 Takeaways:

- Medical schools ranked 1-25 in research intensity reported increases to both average DCE per total research lab space and average NASF between FY 2018 and FY 2022 (19% and 6%, respectively), while medical schools ranked above 25 reported slight decreases in average NASF.
- In FY 2022, medical schools ranked 1-25 reported 111% more in average NASF and 30% more in average DCE per NASF than medical schools ranked 26-50, and 720% more in average NASF and 45% more in average DCE per NASF than medical schools ranked above 50.

Conclusion

This data snapshot presents updated benchmarks utilizing FY 2022 OMS data and offers insight into the productivity of research laboratory spaces. Overall, the data indicate positive trends in research productivity and efficiency, despite variations in OMS participation rates and nuances across respondent institutions. Productivity benchmarks indicate that, on average, research activities are yielding greater cost expenditures per NASF, and this trend appears consistent across the diverse set of medicals schools that participated in the OMS.

By providing insight into funding patterns and opportunities for enhancing research facilities, these benchmarks can empower medical schools and associated institutions to make informed decisions aimed at bolstering academic medicine and research.

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Glossary: Definitions Used in the Operations Management Survey

Dry/computational lab space: Dry lab, or dry laboratory space, is where computational or applied mathematical analyses are done with the assistance of computer-generated models. Dry lab space also includes office space for conducting interviews and any other space in which research takes place that is not classified as wet lab space.

Research/nonclass laboratory: A space used for laboratory experimentation, research, or training in research methods; professional research and observation; or structured creative activity within a specific program or for sponsored research (whether sponsored with federal, state, private, or institutional funds).

Research/nonclass laboratory service: A space that directly serves one or more research/nonclass laboratories as an extension of the activities in those spaces.

Wet lab space: Wet lab, or wet laboratory space, is laboratory space where chemicals, drugs, or other biological matter are tested and analyzed using liquids.