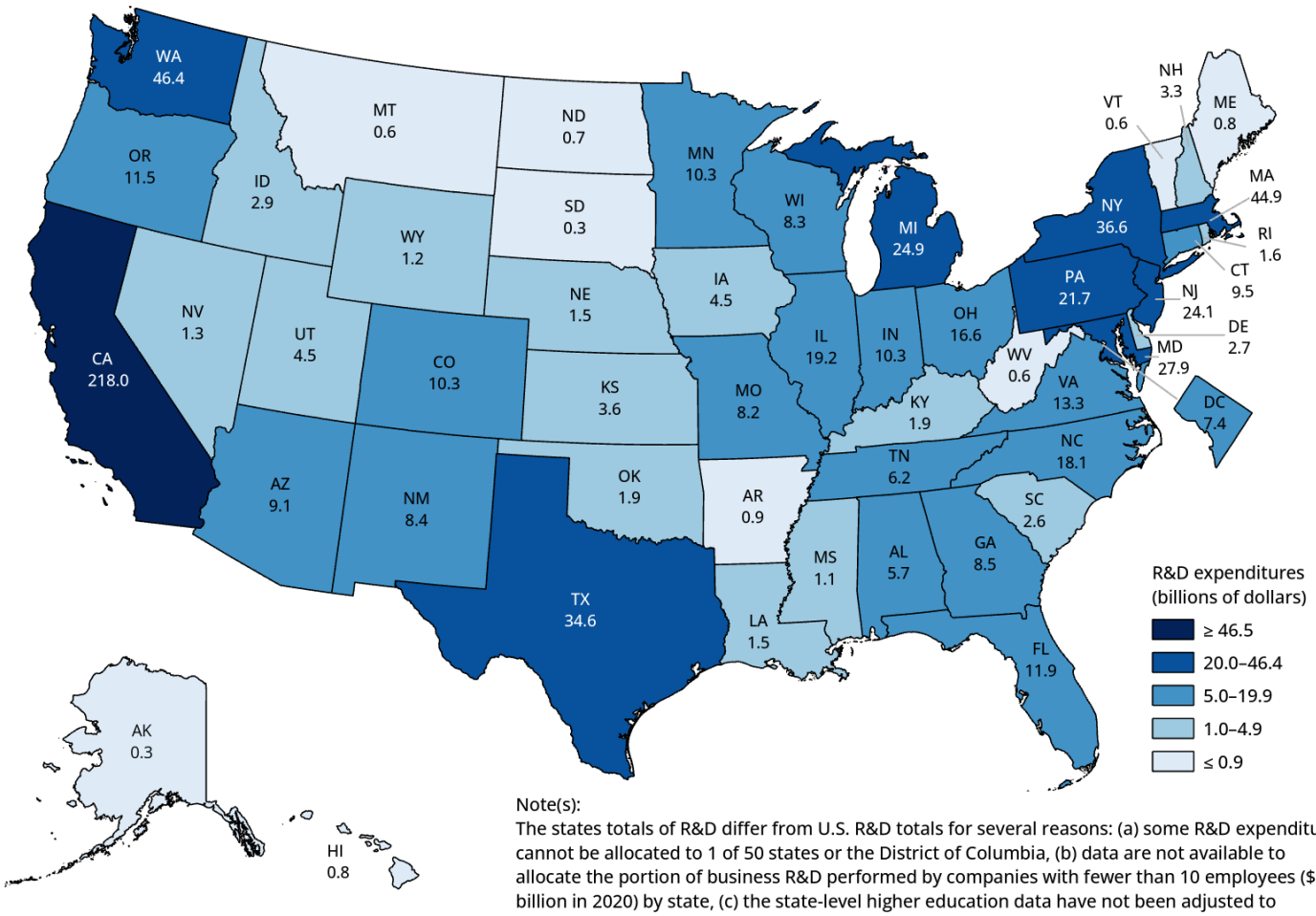
California Leads in Innovative Capacity of U.S. States as Measured by U.S. R&D Expenditures

R&D Expenditures by State: 2020

Total expenditures on R&D within a state is an indicator of that state's innovative capacity. Total R&D expenditures in the United States are funded by businesses ($520.4 billion; 72.6% share), the federal government ($147.7 billion; 20.6%), higher education institutions ($22.3 billion; 3.1%), nonprofits ($20.1 billion; 2.8%), and the state governments ($5.7 billion; 0.8%). For public institutions, when state appropriations are restricted for R&D use, the state government is reported as the source of funding. In contrast, some state government funding is not restricted for R&D activities and is reported as R&D performed by higher education institutions with the institutions' own funds. California is the dominant state with $218 billion of total R&D expenditures, accounting for 30.5% of total U.S. R&D of $714 billion that can be allocated to individual states (figure 1). The four states with the next highest amounts of R&D expenditures are Washington ($46.4 billion), Massachusetts ($44.9 billion), New York ($36.6 billion), and Texas ($34.6 billion).

Figure 1: Total R&D Expenditures by State: FY 2020



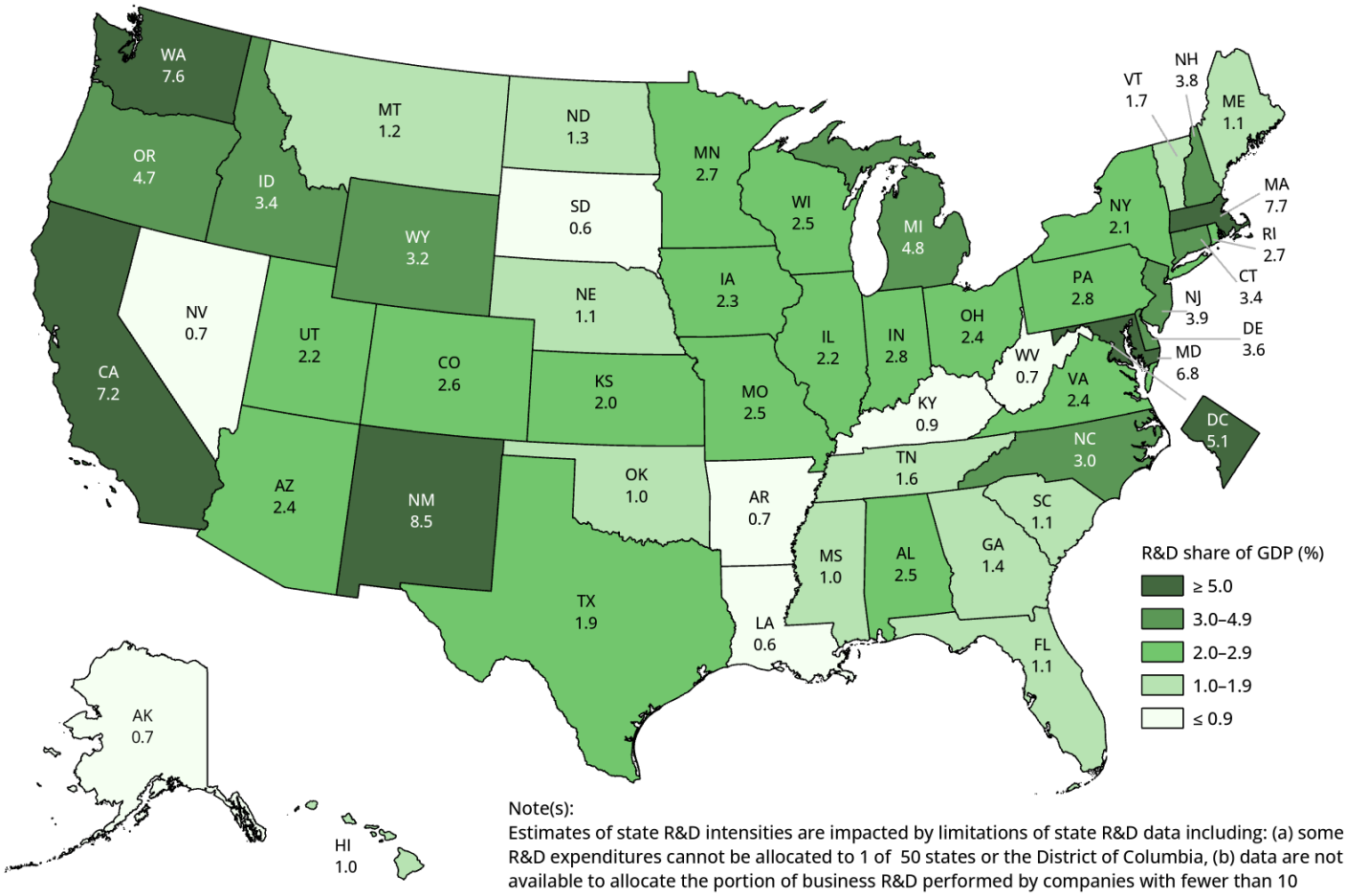
Note(s):
The states totals of R&D differ from U.S. R&D totals for several reasons: (a) some R&D expenditures cannot be allocated to 1 of 50 states or the District of Columbia, (b) data are not available to allocate the portion of business R&D performed by companies with fewer than 10 employees ($5.6 billion in 2020) by state, (c) the state-level higher education data have not been adjusted to eliminate the double counting of funds passed through to other performers, and (d) state-level R&D data are not converted from fiscal years to calendar years.

Source(s):
National Center for Science and Engineering Statistics (NCSES). 2023. National Patterns of R&D Resources: 2020–21 Data Update. NSF 23-321.

State R&D Intensity: 2020

State R&D intensity is measured by R&D expenditures as a share of a state's gross domestic product (GDP). New Mexico has the highest R&D intensity (8.5%) due in part to two large R&D laboratories sponsored by the Department of Energy (figure 2). Other states with high R&D intensity include coastal states: Massachusetts (7.7%), Washington (7.6%), California (7.2%), and Maryland (6.8%).

Figure 2: Total R&D Intensity by State: FY 2020



Note(s):
Estimates of state R&D intensities are impacted by limitations of state R&D data including: (a) some R&D expenditures cannot be allocated to 1 of 50 states or the District of Columbia, (b) data are not available to allocate the portion of business R&D performed by companies with fewer than 10 employees ($5.6 billion in 2020) by state, (c) the state-level higher education data have not been adjusted to eliminate the double counting of funds passed through to other performers, and (d) state-level R&D data are not converted from fiscal years to calendar years.

Source(s):
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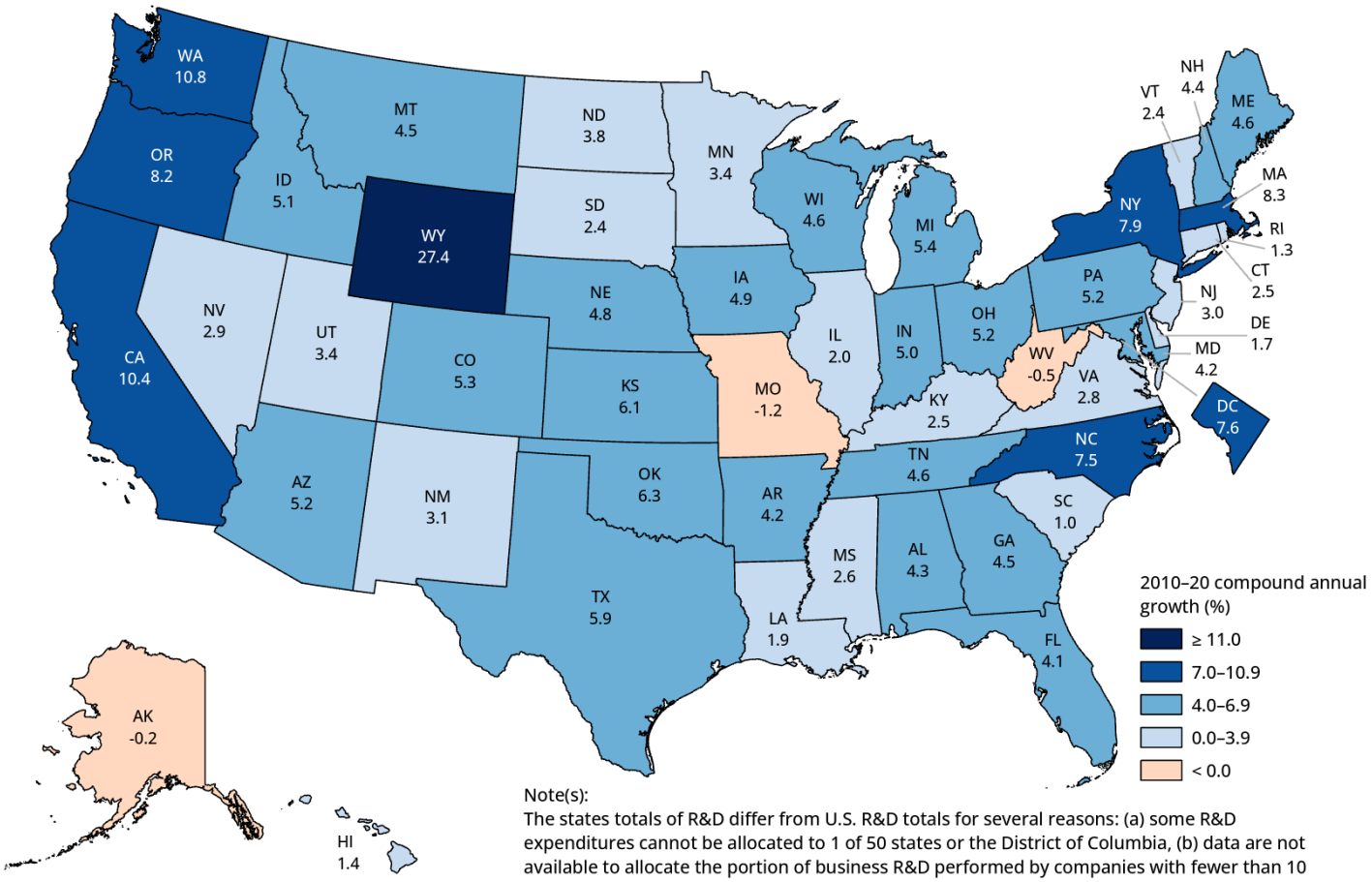
Changes in Total R&D Expenditures by State: 2010–20

Changes in total R&D expenditures between 2010 and 2020 varied across states. Between 2010 and 2020, the United States' total R&D increased at a compound annual growth rate of 6% to reach $717 billion. Wyoming grew the fastest with total R&D expenditures increasing at a compound annual growth rate of 27% to reach $1.2 billion (figure 3). The next four fastest states—Washington, California, Massachusetts, and Oregon—on average grew between 8% and 11% annually. California's R&D expenditures increased from $81 billion to $218 billion, the largest increase in the amount of R&D of any state. The increase of Washington's R&D expenditures was also sizeable, from $17 billion to $46 billion.

Figure 3: Change in States' Total R&D Expenditures: FY 2010–20



Note(s):
The states totals of R&D differ from U.S. R&D totals for several reasons: (a) some R&D expenditures cannot be allocated to 1 of 50 states or the District of Columbia, (b) data are not available to allocate the portion of business R&D performed by companies with fewer than 10 employees ($5.6 billion in 2020) by state, (c) the state level higher education data have not been adjusted to eliminate the double counting of funds passed through to other performers, and (d) state-level R&D data are not converted from fiscal years to calendar years.

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