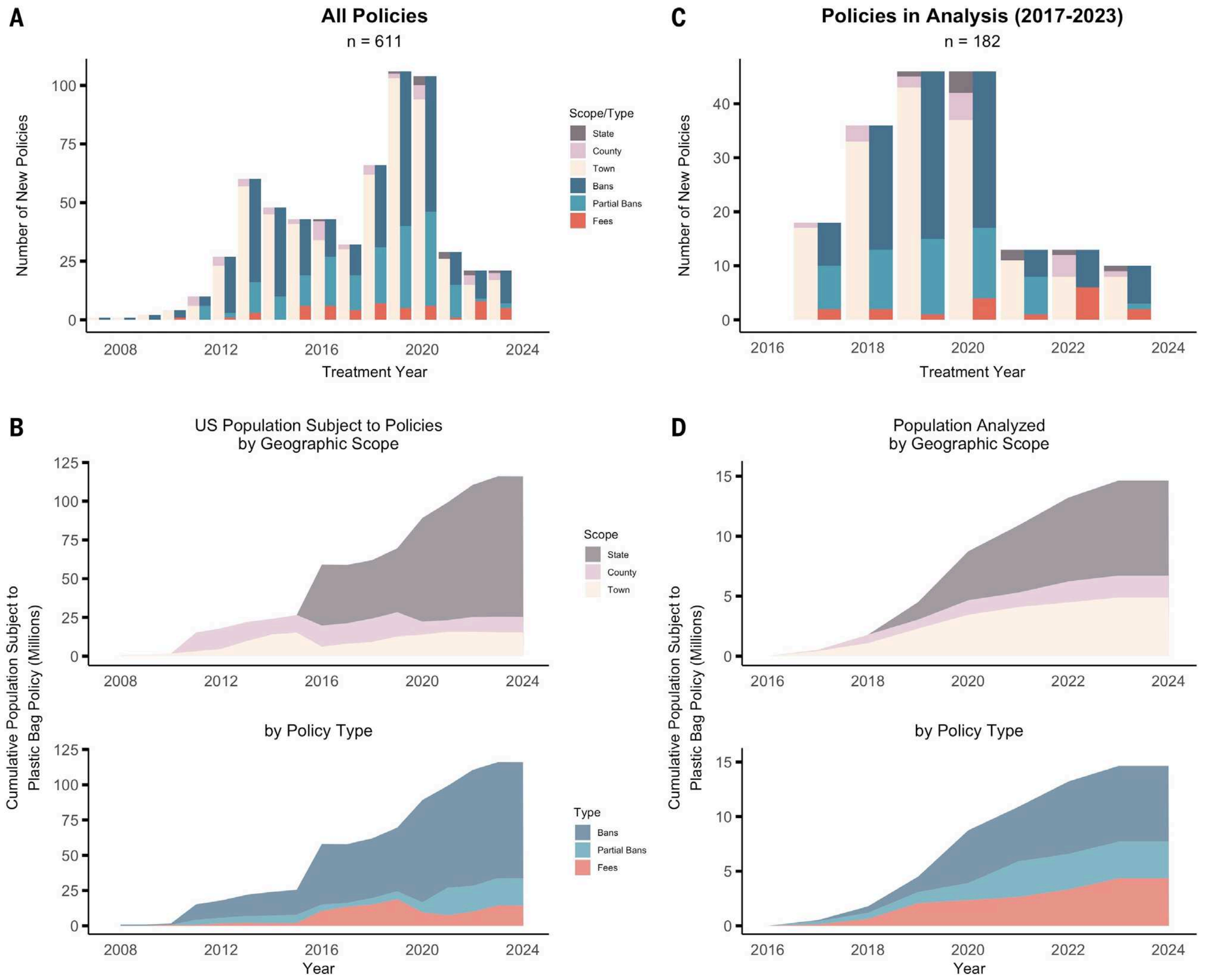

Fig. 1. Summary statistics on US plastic bag legislation. (**A**) The number of new policies implemented in each year (2008–2023) by geographical scope and type of policy. [Four policies before 2008 are not shown. These are town-level bag bans in Nantucket, MA (1990); Galena, AK (1998); Saint Paul Island, AK (2002); and San Francisco, CA (2007).] (**B**) The cumulative number of US residents in a locality with plastic bag laws of various geographical scope (top) and policy type (bottom). If a zip code experiences different policies over time, the first type of policy is shown. (**C**) The number of new policies implemented in each year that are used in our analyses (2017–2023). This is determined both by policy timing and cleanup locations. (**D**) The cumulative number of US residents in zip codes with policies and cleanups used in our analyses, shown by geographical scope (top) and policy type (bottom). If a zip code experiences different policies over time, the first type of policy is shown.

the number of all cleanup items to ensure that these results are not driven by changes in the denominator (fig. S9). We do not find evidence of bag laws affecting the total number of items collected. We also repeat our analyses for a subset of cleanups more consistent in size or timing (coastal cleanups and annual International Coastal Cleanup Day cleanups) using the number of plastic bags collected per person. We find decreases in this measure as well (fig. S10).

Next, we implement several alternative specifications to test the robustness of our main results. In these main analyses, we assume that the outcome variable is unbounded. However, in reality, plastic bags' share of cleanup items is between 0 and 100%. We repeat our analyses using a beta regression and logit transformations of the dependent variable and show that this assumption does not meaningfully affect our results (fig. S11). We also repeat our main analyses with only plastic "grocery" bags and find similar although slightly less precise results, likely because of inconsistent classification between plastic grocery bags and other plastic bags. We also test different levels of temporal and spatial aggregation of the cleanup data. In addition to aggregating cleanup observations at the year level, we aggregate at the quarter and month levels. We also test spatial aggregation at the 0.01° (or ~1.1 km) grid cell level. We find that our main results hold across all these spatiotemporal scales, although, as expected, our estimates are less precise when aggregating at too small a scale (e.g., 0.01° cell by quarter). In our main analysis, we use the date the first policy took effect in a given zip code. In robustness checks, we repeat our analysis only with areas with exactly one policy and separately restrict our analysis only to treated areas. We then also restrict the cleanup data to only large cleanups (>25 attendees), small cleanups (<5 attendees), and those without kids. We also address concerns that COVID-19–related changes in plastic litter may coincide with plastic bag law implementation (e.g., areas with stricter plastic waste policies may also have stricter pandemic measures). To account for this, we rerun our regressions, excluding observations first from 2020 and then from both 2020 and 2021. Overall, our main results are robust to these alternative samples and approaches (fig. S12). Finally, repeated cleanups in the same area are a cause for potential concern as prior cleanups—not