Who do we invent for?
Patents by women focus more on women's health,
but few women get to invent

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Abstract

Women engage in less commercial patenting and invention than men, which may affect what is invented. Using text analysis of all US biomedical patents filed from 1976 through 2010, we find that patents with all-female inventor teams are 35% more likely to focus on women's health than all-male teams. This effect holds over decades and across research areas. We also find that female researchers are more likely to discover female-focused ideas. These findings suggest that the inventor gender gap is partially responsible for thousands of missing female-focused inventions since 1976. More generally, our findings suggest that who benefits from innovation depends on who gets to invent.

The inventor gender gap is well established. While progress has been made, women are still less likely to enter STEM occupations, less likely to continue in scientific careers, and less likely to become inventors (1–6). Even today, only 35% of STEM scientists and 13% of US patent inventors are women, suggesting that there are many “lost Curies,” talented girls who never grow up to discover and invent (7–9).

While the gap itself is cause for concern, its consequences may extend beyond the labor market (10). It is possible that women are more likely to invent for women, and if so, the dearth of female inventors may cause society to supply too few inventions that benefit women. In fact, recent work suggests a shortage of projects, procedures, and products aimed at female patients’ needs (11–13). Anecdotal evidence abounds that a disproportionate share of female-focused inventions—ovarian cancer tests, personalized breast cancer trials, cataract removal procedures¹—are invented and brought to market by women (14–16).

Yet there is little systematic evidence on whether female-invented products are more likely to focus on the needs of women, especially in knowledge-intensive domains like biomedicine. On the one hand, the lived experiences of female inventors may lead them to see opportunities to invent for people like themselves, specialize in clinical and disease areas that men may overlook, and invent with more knowledge of women’s health (17, 18). On the other hand, medical inventors generally have extensive training in MD and PhD programs, which could eliminate knowledge differences between male and female researchers. Furthermore, inventions follow market demand (19). It could be that inventors, male or female, simply invent where the market pulls them.

Here, we measure the gender of inventors and the sex focus of their inventions for all U.S. biomedical patents filed between 1976 and 2010. We find that, in this field, inventions by women are more likely to focus on the medical needs of women. This pattern is strongest for all-female invention teams, holds over decades, and is present even within narrow areas of invention. This last finding suggests that the female inventor-invention link is both the result of women working in more female-focused research areas and female inventors identifying

opportunities to invent for women regardless of the area in which they work. We also analyze biomedical research articles between 2002 and 2020, and we find that female-discovered ideas are also more likely to be female-focused. That upstream research ideas also exhibit a female inventor-invention link further suggests that the gender gap in who commercializes their ideas has contributed to the sex gap in what types of ideas become inventions.

The starting point for our analysis is a new measure for a patent’s focus on the medical needs of men and/or women. We extract the title, abstract, and start of the summary text from the 441,504 “Drugs and Medical” patents in the PatentsView-NBER dataset. We then feed this text through the National Library of Medicine’s Medical Text Indexer (MTI) (20). The MTI algorithm uses machine learning to map text to the Medical Subject Heading (MeSH) terms that most likely reflect the text’s content. S1 gives more details.

The MeSH ontology includes two tags for the sex focus of the patent. A patent’s text gets the “Female” tag when it covers “female organs, diseases, physiologic processes, genetics, etc.” There is a parallel “Male” tag. We refer to the 12.76% of patents the MTI tagged “Female” as female-focused patents. Conversely, 13.27% of patents are male-focused. In S2 we validate the MTI algorithm, showing that it works well with patent text and that its accuracy is unbiased with respect to inventor gender. In S3 we show that, while the female and male MeSH tags are a coarse measure of sex focus, they capture significant differences in the likelihood that a patent benefits women or men. For example, with word-embedding methods and clinical-trial data we show that female- and male-tagged patents are roughly 400% more likely to describe inventions that would be evaluated by a female- or male-only trial. Furthermore, with data on disease incidence we show that patents tagged as female address diseases that impact roughly twice as many women; we find a similar pattern for male-tagged patents and men. We measure inventor gender using a standard dictionary-matching process (See S4 for details). Our final sample includes 430,060 patents with inventor-gender and sex-focus measures.

Our first set of analyses explores raw trends in the gender composition of inventors. We

do so by splitting our data into two groups: patents with majority-female inventing teams ($\geq 50\%$ women) and patents with strictly more male inventors ($> 50\%$ men). In Figure 1 we show that women-invented biomedical patents are on the rise, growing from 6.3% in 1976 to 16.2% in 2010. Yet the 3,014 inventions by female-majority teams in 2010 are still outnumbered by the 3,347 patents invented by men nearly four decades earlier, in 1976. In total, male-majority teams generated 373,774 patents, female-majority teams 56,286.

[Figure 1 about here.]

Figure 2 shows trends in the sex focus of invention for male-majority teams (A) and female-majority teams (B), with the black solid line showing the percentage of patents that are female-focused and the gray dashed line male-focused. Panel 2A shows that male-majority teams invented more for men than for women in all but one year of our data, though the difference has shrunk. In 1976, patents by male-majority teams were 15% more male-focused (11.2%) than female-focused (9.7%); in 2010, 6.2% more male-focused (13.7%) than female-focused (12.9%). Intriguingly, this narrowing follows efforts by the NIH and NSF starting in the late 1980s to promote research on women’s health (21). Overall, of the 373,774 patents invented by male-majority teams, 49,886 (13.3%) were male-focused, 46,453 (12.4%) were female-focused, while the rest were tagged as not sex-focused.

[Figure 2 about here.]

Panel 2B shows that female-majority teams are substantially more likely to invent for women and only slightly less likely to invent for men than male-majority teams are. In fact, in 1976, patents by female-majority teams were 7% more male-focused (12% vs. 11.2%) and 37% more female-focused (13.3% vs. 9.7%) than patents by men. As with male-majority teams, by 2010, female-majority teams invented more often for both sexes. On average, of the 56,286 patents invented by female-majority teams, 8,246 (14.7%) were female-focused, 7,053 (12.5%) were male-focused, and the rest were not tagged as sex-focused. Compared to

male-majority teams, female-majority teams are only 6% (12.5%/13.3%) less likely to invent for men, but they are 18.5% (14.7%/12.4%) more likely to invent for women.

Figure 3 shows that the inventor gender gap amplifies these invention sex gaps. Panel 3A shows the number of female-focused minus male-focused patents invented by male-majority teams over time. Such teams regularly invent over one hundred additional male-focused inventions per year. Panel 3B shows the same difference for female-majority teams. Male and female inventors seem to have offsetting tendencies; but because there have been so many more male inventors, in aggregate invention has been skewed toward men’s health (Panel C). The rising share of female inventors, and their increased focus on the needs of women, has begun to close and in some years flip the invention sex gap.

[Figure 3 about here.]

To further explore the magnitude and consequences of this female inventor-invention link we turn to patent-level models that regress a patent’s female focus on whether the invention team falls into one of four buckets: all-female, majority (50% or more) but not all female, minority-female, and all-male (our excluded baseline). Our model includes fixed effects for the year interacted with the patent’s subcategory (Drugs, Surgery & Instruments, Biotechnology, or Other) and the patent team’s size (22). See S5 for additional details and tables. The estimates from this model, shown in black in Figure 4A, show a clear dose-response relationship increasing from 1.3 ± 0.16 ($\pm S.E.$) ($p < 0.001$) percentage points for minority-female to 2.4 ± 0.19 ($p < 0.001$) for majority-female teams, and to 4.6 ± 0.30 ($p < 0.001$) for all-female teams. These reflect relative increases of 10%, 18%, and 35% over the baseline female-focused invention rate of all-male teams.

[Figure 4 about here.]

These estimates are the result of two possible pathways. First, women might work in more female-focused research areas. Second, women might draw on different experiences and

knowledge, regardless of their research area. If the first pathway is the main one, then the benefit to women of there being more female inventors will be concentrated in areas that are already female-focused (E.g., additional pre-eclampsia treatments). If the second pathway matters more, then women would also see benefits in research areas without a strong prior sex focus (E.g., female-focused atrial fibrillation treatments).

To isolate the within-research-area mechanism we match female-invented patents to male-invented patents using the patent’s publication year, subcategory, team size, and the narrow MeSH level-four disease area most associated with the invention (E.g., 1983 drug patents for atrial flutter [C14.280.067.248] with two inventors, or 1990 surgery patents for atrial fibrillation [C14.280.067.198] with three inventors). Figure 4A’s estimates in gray come from this matched sample, which is roughly a tenth the size of our full sample, and includes year $\times$ subcategory $\times$ team size $\times$ disease fixed effects. After tightly matching within research areas, just over half of the total effect remains, with effect sizes for minority, majority, and all-female teams of 0.67 ± 0.37 ($p = 0.36$), 1.3 ± 0.37 ($p = 0.002$), and 2.8 ± 0.55 ($p < 0.001$) percentage points. In other words, the female inventor-invention link stems equally from women working in female-focused research areas and from women spotting opportunities in other research areas.

In the supplemental materials we report additional analyses. In S6 we show that inventions by women are not merely more sex-focused in general, which could be so if women work in applied areas where anatomical sex differences are more central or if women are more likely to run sex and gender analyses (23). Instead, and consistent with Figure 2, we find teams with female inventors, compared to all-male inventor teams, are neither more nor less likely to invent for men. S7 presents robustness checks, including analyses showing that patents with all-female teams target diseases that impact 16% more women and are roughly 40% more likely to describe an invention that would be evaluated by a clinical trial that only enrolls women. S8 shows that our within-disease-area findings hold if we instead rely on different matching criteria, multi-dimensional disease fixed effects, or lasso-style machine-

learning methods, all of which further account for differences in where women and men invent.

In S9 we explore heterogeneity in the female inventor-invention link. We find little evidence that the female inventor-invention link has consistently increased or decreased with time. We find suggestive evidence that all-female teams are 2.4 percentage points more likely to invent for women in non-corporate than in corporate settings, which is consistent with the idea that limited women’s representation in corporate management leads firms to overlook female-focused R&D opportunities (24). We also show that all-female teams are 8.7 percentage points more likely to invent for women in the surgery subcategory, versus 2.3 percentage points in drugs. This last difference is consistent with the idea that the historical hostility towards women in surgery (25) has both involved men dismissing promising female-focused surgical ideas and women being especially likely to develop those ideas.

Overall, we find that women’s biomedical inventions are more likely to focus on women’s needs than men’s inventions are. That said, patents are a downstream outcome in the process of discovery and invention. Perhaps nascent female inventors discover ideas for both sexes equally, but gender stereotypes lead women to not patent their male-focused ideas (or men to not patent their female-focused ones). Differential selection into patenting, not differences in the knowledge and experiences that women bring to the discovery process, might be responsible.

To test for differential selection, we use data on the upstream research ideas that biomedical patents build on. Specifically, we analyze 2,062,695 original biomedical research articles from the National Library of Medicine’s PubMed database that are at risk of being commercialized and were published between 2002 (the first year we have data on the authors’ gender) and 2020 (S10 provides further details). We again use the MeSH ontology’s “Male” and “Female” check tags to assess articles’ sex focus, but we do not use the MTI algorithm, because articles in PubMed are assigned MeSH tags by human medical indexers.

Panel 4B mirrors Panel 4A, but shows that research teams with more women are more

likely to *discover* for women. There is again a clear dose-response relationship, with the effect increasing from $0.84 \pm 0.08 (p < 0.001)$ to $3 \pm 0.08 (p < 0.001)$ to $4.5 \pm 0.12 (p < 0.001)$ percentage points for minority, majority, and all-female teams. As in 4A, the gray estimates in 4B involve matching and fixed effects to account for differences in men’s and women’s publishing rates in different narrow disease areas (S11). While the coefficients shrink towards zero, the differences are largely non-significant. Compared to the baseline female-focused publication rate, papers with all-female teams are about 12% more likely to focus on the health needs of women. S12 reports additional robustness tests, including analyses that show that discoveries by women are not more likely to be male-focused, that our findings hold under alternative matching schemes, and that discoveries by all-female teams target diseases that impact 47% more women and are over 40% more likely to describe an idea that would be evaluated by a clinical trial that only enrolls women.

These findings imply that many promising female-focused discoveries have yet to be commercialized, because women are less likely to obtain patents (1, 26). Back-of-the-envelope calculations (S13) suggest that if all the patents invented between 1976 and 2010 had been produced by men and women equally then there would have been roughly 6,500 more female-focused inventions. Even if we focus within research areas, thus holding constant the number of patents produced across areas, we still find that inventor gender equality would have resulted in just over 3,500 more female-focused inventions. If research articles were produced equally by men and women then from 2002 to 2020 there would have potentially been 40,000 more female-focused discoveries. This suggest that there may still be many untapped market opportunities to invent for women, opportunities that could in turn improve women’s health.

It is important to note that these estimates of the number of lost female inventions are suggestive. The primary goal of this paper is to establish a link between the background of inventors and who might benefit from their inventions. We do not observe the counterfactual world where there are more (or fewer) female inventors or scientists. Hence, the evidence presented here cannot tell us whether women’s female-focused inventions could have instead

been invented by all-male teams, or the extent to which female inventors might displace men from working on women’s health, or whether women might instead pursue other, non-female-focused ideas if there were a greater share of female inventors and inventions. Our analyses also cannot tell us if the gender mix of inventions is or ever has been socially optimal. Finally, while recent work finds that demographic similarity between doctors and patients improves female and African American health outcomes (18, 27, 28), our analysis does not shed light on whether female-invented and -focused patents are more original or impactful. We see each of these limitations of the present study as a promising avenue for more research.

That research should not be limited to the differences between men and women, nor to biomedicine. Our findings sketch a road map for future research on demographics and innovation. Reducing the barriers that disadvantaged groups face when working and inventing has accounted for a non-trivial share of economic growth over the last century (29). In virtually all cases, though, whether the population under study has been 19th-century Black inventors (30), early-20th-century Eastern European scientists (31), or some other group, the focus has been on how discrimination has reduced the *overall level* of innovation. By contrast, we find a robust and sizable connection between inventor gender and the sex focus of inventions. This is an important step in showing how labor-market bias might spill over into product-market bias. While earlier work on gender and innovation has focused on estimating biases against entrepreneurs and inventors while holding the underlying idea constant (e.g. (32)), we hope future work will focus on understanding bias against *ideas* that especially benefit historically disadvantaged groups (33). Our findings here suggest that inequities in who invents may lead to inequities in who benefits from invention.

Notes

¹Cataracts are more common in women than in men (34).

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Supplementary Materials

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Figure 1: Total number of U.S. biomedical patents over time along with the number of patents with majority female ($\geq 50\%$ women) and majority male ($> 50\%$ men) inventor teams. Includes 430,060 patents from 1976 through 2010.

Panel A shows that male-majority teams are more likely to invent for men than for women. Panel B shows that female-majority teams are especially likely to invent for women and nearly as likely to invent for men as male-majority teams are.

Figure 2: Percentage of U.S. biomedical patents that are male-focused and female-focused broken out by the gender composition of the inventor team. Panel A shows the percentages for patents with majority male teams ($> 50\%$ men) and Panel B shows patents with majority female teams ($\geq 50\%$ women).

Figure 3: The number of female- minus male-focused patents over time. The first row is the gap for all biomedical patents. The second row is the gap for patents with male-majority teams ($> 50\%$ men). The third row is the gap for patents with female-majority teams ($\geq 50\%$ women).

Figure 4: Both panels show the increased chance, in percentage points, that a female-invented patent or research article is female-focused, compared to a patent or article from an all-male invention team. The bars show robust 95% and 99% confidence intervals. Panel A reports estimates using the patent data. Black estimates come from a model fit using OLS with year $\times$ subcategory and year $\times$ team-size fixed effects. The gray estimates are from models that match teams with female inventors to all-male teams using the patent's year, subcategory, team-size, and disease focus. The full sample includes 430,060 patents; the largest matched sample includes 45,751 patents. Panel B reports estimates using the research-article data. Black estimates are from models fit using OLS with year $\times$ journal and year $\times$ team-size fixed effects. The gray estimates are similar but also match teams with female inventors to all-male teams using the patent's year, team-size, and disease focus. The full sample includes 2,062,695 articles published in the 1,000 journals in PubMed with the highest commercialization impact factors from 2002 through 2020; the largest matched sample includes 119,650 papers.

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Supplementary Materials

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S-1 Building the patent dataset and assigning MeSH terms to patents with the MTI algorithm

Our patent data come from the PatentsView and NBER patent data files. We focus on the universe of “Drugs & Medical” patents (Patent category 3) filed from 1976 through 2010. As of writing, the NBER patent data covers patents granted through 2015. Since approval can take years, the dataset only includes patents filed in 2014 that were approved within one year, within two years for 2013, and so on. The vast majority of patents are approved within four years. Thus we drop all patents filed after 2010 to ensure that our sample reflects the population of eventually granted patents for any given filing year. Our results are essentially unchanged if we include the post-2010 patent data. After this cleaning, we have 441,580 inventions.

To classify patents by the disease or condition they target, we draw on the National Library of Medicine’s Medical Text Indexer (35, 36), which generates Medical Subject Headings, or MeSH terms, for a given body of text. We passed the first 2,500 characters of each patent’s title, abstract, and summary through the National Library of Medicine’s Medical Text Indexer (MTI). According to its documentation, the MTI allows up to 10,000 characters of input text, but we found that the indexer was much more likely to “choke” and crash when the input text approached this length. After trial and error, we found that limiting the text to 2,500 characters produced substantially fewer failed classification runs. (“Failed” in the sense that the indexer ran without crashing, not in the sense that it failed to classify a patent’s text.) Using just the title and abstract yields similar findings. We use the default MTI settings for non-Medline text, and we output MeSH terms from the 2018 edition.

Because the MTI’s purpose is to help medical researchers discover related work, its default results are “greedy,” suggesting hundreds of potentially related (but low-scored) terms. We therefore discard the least-related MeSH terms with scores of 0 or -1. We then use the remaining MeSH terms returned by the MTI in our analysis. Our findings are unchanged if we restrict the MeSH terms we analyze to the top 10 or top 25 terms returned by the MTI algorithm. See S14 for summary statistics.

S-2 Validating that the MTI algorithm works with patent text

A potential concern with using the MTI to assign sex focus to patents is that its algorithm was not designed with this specific task in mind. Rather, it was designed to classify journal articles, to aid researchers. This poses three risks for this study. The first is that the MTI might simply produce extremely noisy estimates of a patent’s sex focus that are unrelated to how a human reviewer might assign MeSH tags. The second and more serious is that, for whatever reason, the MTI could assign one gender tag or the other at significantly higher rates when confronted with this novel text corpus. This would introduce bias, rather than just noise, into our models. Finally, the female and male MeSH tags *in and of themselves* might not actually reflect whether a patent is more or less focused on the medical needs of women or men, irrespective of whether they are assigned by a human reviewer or an algorithm. Here we address these first two concerns. The next section addresses the third concern, about construct validity.

To address whether the MTI assigns tags as a human indexer would, we hired two indexers who have worked on assigning MeSH terms to biomedical research articles. Both have worked as indexers for a decade. We presented each of them with 480 randomly selected patent texts and asked them to assign MeSH terms as though they were evaluating an article, in their usual manner. Neither indexer was informed that we were studying whether female inventors invented for women. They were informed that we were studying the classification accuracy of the MTI algorithm on patents. Each evaluated patents independently.

To aid in this evaluation, we developed a custom web app for evaluating the MeSH terms applied to a patent. The indexers were shown the patent’s title and the text that we fed to the MTI. They were *not* shown the names or gender of the inventors. Nor were they given a link to the patent. This ensured that we could evaluate the MTI’s accuracy on exactly the same data that we fed to the MTI.

Figures S-1, S-2, and S-3 are screenshots from the web app, showing the patent’s text and the MeSH terms that the MTI had assigned it. The indexers were instructed to click on any MeSH terms they thought were inappropriately applied to the patent. At the bottom of the screen, they were instructed to add any MeSH terms that they thought the MTI had overlooked. MeSH indexers regularly use the MeSH-on-demand tool, which uses the MTI to generate suggested MeSH terms,

as a starting point for their work indexing biomedical research articles.

Finally, we listed three check tags that are always displayed at the top of the app. These tags are “Human,” “Female,” and “Male.” If the tag was not selected by the algorithm, the indexer could click on it to apply it to the patent. When indexing biomedical articles, check tags are always displayed, so that indexers make sure to either select or not select the check tags. We again note that the female and male check tags have specific definitions in the MeSH ontology. Indexers are supposed to apply the “Female” check when the text covers “female organs, diseases, physiologic processes, genetics, etc.” Indexers are supposed to apply the “Male” check when the text covers “male organs, diseases, physiologic processes, genetics, etc.”

Each indexer was asked to evaluate 480 randomly selected patents. Since female-invented and female/male-focused patents are relatively rare, and to ensure that we could evaluate errors in different sub-samples of our data, we stratified the sample on whether the patent is from a female-majority team (50% or more female inventors), is female-tagged, is male-tagged, and is from before 1996, and then by its subcategory. In each of the resulting 32 strata we *randomly* sample 15 patents for validation. Since we use stratified oversampling, all the cross-tabulations below include sampling weights to give population-weighted estimates for the algorithm accuracy across our entire sample. We classify a patent as female- or male-focused when both indexers agree that it is. The indexers could skip patents that they thought they lacked expertise to evaluate. Only 5 patents were skipped, yielding 475 patents evaluated by both indexers.

In Table S-1 we show the recall/precision rates for whether a patent is female-focused. The rows indicate whether the human indexers tagged the patent as covering “female organs, diseases, physiologic processes, genetics, etc.” The columns indicate whether the MTI algorithm tagged the patent as female-focused. Recall, or one minus the false-negative rate, is the estimate in the top left; the false-negative rate is the estimate on the bottom left. Precision, or one minus the false positive rate, is the estimate in the bottom right; the false positive rate is in the top right. Table S-1 shows that the MTI has surprisingly good precision, about 93%, for whether a patent is female-focused. Recall is less strong at 65% but, as we discuss below, this is par for the course for indexing algorithms. Further, the F_1 score is 0.77, which compares favorably to estimates of the MTI’s F_1 on PubMed articles, 0.74, for the female-check tag as of 2016 (37).

Table S-2 shows the recall/precision rates for whether a patent is male-focused. The estimates

therein do not statistically differ from those in Table S-1. The MTI appears to do as well at classifying patents as male-focused as it does at classifying them as female-focused, with an F_1 score of 0.78. Again, this is consistent with past work showing that the MTI, when analyzing PubMed articles, has an F_1 of 0.71 (37). Overall, these results imply that the indexers thought that many more patents should have been tagged as male or female than the MTI did. Far from being likely to over-assign sex tags, the MTI indexer appears conservative.

We next check whether the algorithm is more or less accurate for male- versus female-majority teams. Table S-3 presents recall/precision rates for female-majority teams (50% or more female inventors) and for male-majority teams (strictly less than 50% women). Precision is slightly higher for female-majority teams, but the difference is not significant. Recall is nearly identical. If anything, the MTI is somewhat more likely to falsely classify a patent as female-focused when the team is majority-male. This would bias our estimates of the female inventor-invention link downward.

Table S-4 replicates Table S-3, but for whether the patent is male-focused. We again find no significant differences across team composition. It does not appear that our findings are driven by biases in the MTI algorithm. In additional analyses, we also find that the algorithm’s precision and recall is the same for patents before and after 1996 (This is halfway through the sample; we find no sensitivity to the year in which we break the sample). The only meaningful difference we find is between drug and surgery patents. The MTI’s recall rates are just above 70% for drugs, compared to about 55% for surgery patents.

It is worth comparing these these precisions/recall rates against other benchmarks of the MTI. Mork et al. (20) find that, when indexing biomedical research articles, the MTI’s recall and precision rates had converged to about 60% by 2014. In a more recent article Rae et al. (38) compare the performance of the MTI against a state-of-the-art convolutional-neural-net algorithm. While these methods have a lot of promise, their present performance gains are modest, at about 3%. Finally, [the most recent BioASQ Challenge](#), in which teams compete to develop algorithms that better index medical journal articles, the best submission in the final round had a precision of just over 70% and a recall of 59%, compared to the MTI’s rates of 60%. Finally, as mentioned above, Demner-Fushman and Mork (37) find that the MTI as of 2016 has F_1 scores for the male and female check tags when analyzing PubMed text that are very similar to what we find when applying the MTI

to biomedical patent text. The MTI appears to generalize well for our purposes.

To summarize, our independent validation of the MTI using professional human indexers suggests that the MTI produces somewhat noisy but unbiased estimates of whether a patent would be assigned the female or male tag by a human indexer.

Before turning to the next section, which validates that patents tagged with the female check tag are in fact more focused on the medical needs of women, it is worth noting that, by relying on the MTI’s sex tags, we implicitly treat a patent’s gender focus as focusing on neither sex, just women, just men, or both men and women. This is a crude simplifying assumption. Patents likely address the sexes on a continuum. The next section tackles some of these concerns, though we hope future work continues to build more nuanced measures of a patent’s sex focus that take into account the non-binary nature of both sex and gender.

S-3 Measuring and validating the sex focus of inventions

Are inventions tagged with the “Female” MeSH term more likely to meaningfully focus on the medical needs of women? Do “male”-tagged inventions disproportionately benefit men? Appendix S2 demonstrates that the MTI algorithm tags patents as female or male similarly to how trained human medical indexers do. However, indexers are encouraged to be relatively aggressive in applying the female and male MeSH check tags. For example, the female tag is supposed to be applied when a paper focuses on “female organs, diseases, physiologic processes, genetics, etc.” but can also be applied when the paper merely describes collecting samples from “women,” even if the research doesn’t especially benefit women. This raises an important construct-validity concern: do the female/male check tags measure differences in an invention’s likelihood of focusing on the medical needs of women or men?

Measuring whether an invention “focuses on the medical needs of women” is non-trivial. On the one hand, there are cases where the focus on women is obvious. For example, an invention diagnosing whether ovarian cysts are cancerous will clearly benefit women. Indeed, the entrepreneur Surbhi Sarna eventually built just such an invention after suffering from a ovarian cyst as a teenager (14). On the other hand, many inventions benefit women in less obvious ways. For example, Patricia Bath, the first black female doctor to receive a medical patent, invented a more precise treatment for cataracts. Her interest in the subject grew from her concern that African Americans, and especially black women, were almost an order of magnitude more likely to suffer from Glaucoma and blindness than white men (16). Thus, while the invention may not explicitly call out female anatomy, by focusing on a condition that especially impacts women and black patients, the invention benefits both groups. Finally, an invention might target diseases that equally impact both men and women, but the development of the drug or intervention might have relied on all-male samples and/or failed to do sex analyses that could reveal adverse reactions amongst women (12, 23). Thus, an invention that is tested on samples that include women or that runs a sex analysis might not be explicitly focused on the needs of women, but these inventions might be more likely to benefit women or at least not cause additional harm. Indeed, prior work has used the presence of sex-specific MeSH terms as a proxy for whether academic research engages in sex reporting and analysis (39). Thus, while inventions no doubt vary in who benefits from them, these examples highlight the complex

ways in which an invention can be more or less female/male focused.

Given this complexity, we use four approaches to validate that female-tagged patents are, in fact, much more likely to focus on diseases, topics, and conditions that disproportionately impact women. Across our four measures we find strong evidence that patents tagged as “female” by the MTI are much more likely to benefit women; similarly, patents tagged as “male” by the MTI are much more likely to benefit men. Below we briefly summarize each approach before describing them in detail.

Our first approach uses relatively simple text-analysis tools to identify the words most associated with female/male tagged patents, as compared to non-sex-tagged patents. Consistent with the idea that the female MeSH term reflects “female organs, diseases, physiologic processes, genetics, etc.,” we find that female-tagged patents are 403 times more likely to use the word “menopause,” 245 times more likely to use the word “cervix,” and 7.3 times more likely to use the word “fibromyalgia” than non-female-tagged patents ([four in five fibromyalgia sufferers are women](#)). Male-tagged patents are 274 times more likely to use “erectile,” 146 times more likely to use “prostate,” and 2.2 times more likely to use “parkinson” ([two thirds of Parkinson’s cases occur in men](#)). The final two examples in each list are particularly interesting as they, along with a number of other terms described below, suggest that the male/female MeSH tags capture both obvious and more subtle differences in who is likely to benefit from an invention.

Our second approach relies on human review to evaluate whether a patent is female or male focused, allowing us to check if the aforementioned differences in word usage truly reflect differences in the population of who is most likely to benefit from an invention. Specifically, we sampled 400 patents and then searched for research articles reviewing sex differences in the incidence of the primary condition addressed by the invention. We find that about 60% of patents tagged as female/male are focused on conditions that disproportionately affect women/men; this rate is the same for patents invented by men and women. The majority of sex-tagged patents are sex-focused. Though many are not, such measurement error biases findings towards zero, implying our estimates of the female inventor-invention link are conservative. Further, patents without a sex tag exhibit female and male sex-focus only 5% of the time, implying that a patent tagged with the female or male MeSH tag is an order of magnitude more likely to address medical conditions that particularly impact women or men. When we take these misclassification rates into account, we still find that

the overall percentage of female focused patents hovers around 12%.

Our third approach builds on the spirit of the second approach but uses disease-by-sex incidence data to estimate how many more women stand to benefit from an invention when it is tagged as female. We find that, when a patent is tagged as female, it addresses diseases that afflict 130% more women than when it is not; when it is tagged as male, it addresses diseases that afflict 73% more men than when it is not. On average, female- or male-tagged patents benefit more women or men than non-sex-tagged patents.

Our fourth and final approach measures a patent’s female focus by estimating whether the invention is more likely to be clinically evaluated in a trial that only recruits women. Using enrollment restriction and the text data from of over 350,000 clinical trials from 1994 to 2020, coupled with a word-embedding model trained on our patent and PubMed data, we build an algorithm that takes in text describing an intervention, procedure, or drug and then estimates the probability that it would be tested on only women or only men. We then apply this algorithm to our patent data to estimate the probability an invention would require a single-sex clinical trial. We find that female- and male-tagged patents are roughly 400% more likely to describe inventions that would be evaluated by a female- or male-only clinical trials.

To summarize: across our four approaches, we find strong evidence that the sex MeSH tags capture meaningful differences in which sex is most likely to benefit from an invention. Our disease incidence and estimated female/male-only-trial measures yield two alternative dependent variables that we use to directly test if female inventors are, in fact, more likely to invent for women. In Appendix S7 we show that our results hold when we use either of these measures in lieu of our primary female MeSH tag measure.

S-3.1 Female/male tagged patents use more words associated with female/male “organs, diseases, physiologic processes, genetics, etc.”

Our first approach tests that the words used to describe female-tagged inventions are in fact female focused, and that male-focused words are used for male-tagged inventions. We do so by identifying the 100 words most likely to appear in female-tagged versus non-female-tagged patents. Unfortunately, using raw odds ratios (or similar TF-IDF measures) often yields a noisy word list, because infrequently used words can, by chance, end up over-represented amongst female- or male-tagged

patents. To address this problem, we rely on a weighted log-odds-ratio to generate a z-score for how “over-represented” each word is (40). We then keep words with a score over 3.891 (i.e., $p < 0.0001$) to ensure that observed differences are not artifacts of chance (lower z-score cutoffs yield similar patterns). To ensure that the examples reflect non-esoteric conditions and concerns, we further restrict our sample to words that occur at least 100 times in our 60-million-word patent text corpus, though again other cutoffs yield similar patterns. Here we analyze the same snippets of text we use to produce our primary MTI MeSH tag measures, though yet again these patterns hold if we analyze different quantities of patent text.

Table S-5 shows the 100 words that are most over-represented amongst female-tagged patents compared to non-female-tagged patents. Alongside each word we report the raw odds-ratio¹ and the weighted z-score. The list of words clearly skews female-related. The top words include “gynecologic” (with odds 2,113 times greater in female-tagged than non-female-tagged patents), “woman” (492×), “breastpumps” (552×), “vaginal” (257×), “mammogram” (145×), “pregnancy” (78×), and “endometriosis” (73×). Some of the errors are easily explainable: for example, the most over-represented term is “cows.” While not necessarily relevant for female humans, “cows” does capture patents relevant for female bovines. Indeed, the table reveals that female-tagged inventions often pick up inventions focused on female animals (“sows,” “hens”) instead of female humans. While some of these patents discuss interventions designed for humans but developed on these animals, others are clearly veterinary. In Table S-23, discussed in more detail in Section S7, we show that our findings hold when we exclude patents that discuss animals.

Table S-6 shows the 100 words that are most over-represented amongst male-tagged patents. The terms include “prostatectomy” (3,637×), “cavernosa” (2,008×), “erection” (506×), “testicular” (32×), and “male” (22×). We again see animals listed, with “bull” having an odds-ratio of 287. Consistent with the idea that patents focused on sexual intercourse might be more likely to be tagged as female and male, we see that “clitoris” is 20 times more likely in male- than non-male-tagged patents. However, for female-tagged patents, the same odds ratio is 474, more than 20 times larger again.

While these lists focus on the most over-represented words, it also appears that that sex-tagged

¹We add 1 to the denominator and numerator to avoid divide-by-zero concerns when constructing the odds and odds-ratios. This transformation does not meaningfully alter our pattern of findings.

patents are also more likely to use words that describe conditions that *disproportionately* impact women/men, but that are not exclusively linked to either sex. For example, [drug abuse is roughly two-times more common in men than in women](#). Consistent with this differential impact, we find that the word “cocaine” occurs $2.7(z = 5.0)$ times more often in male-tagged patents and is actually less likely to occur in female-tagged patents ($0.8\times, z = -0.4$). Similarly, [Parkinson’s disease affects men at twice the rate it affects women](#), and we find an odds ratio of $2.2(z = 8.0)$ for male-tagged patents versus $1.2(z = 2.1)$ for female-tagged patents. In terms of diseases that disproportionately impact women, we find that fibromyalgia, [for which women account for over 80% of cases](#), has an odds ratio of $7.3(z = 7.1)$ for female-tagged patents and an odds ratio of $3.3(z = 3.9)$ for male-tagged patents. Lupus, [which is about nine times more common in women than in men](#), has an odds ratio of $2.8(z = 5.9)$ for female-tagged versus $1.9(z = 3.6)$ for male-tagged patents.

We find strong evidence that the words most over-represented in male-/female-tagged patents are words that disproportionately relate to men/women’s health.

S-3.2 Patents tagged as female/male by the MTI are more likely to address conditions that disproportionately impact women/men

Our second approach validates the sex focus of the check tags by reviewing 400 randomly sampled patents: 100 with no sex check tags, 100 with only the female tag, 100 with the male tag, and 100 with both sex tags. For each patent we classified the invention as “female focused” if it addressed conditions and diseases that *disproportionately* impact women. To measure whether a patent disproportionately benefits women, we conducted a literature search on the diseases and conditions the patent addresses. Focusing on review articles, we checked whether prior research has highlighted meaningful differences in the incidence of the disease or condition by sex. For example, as discussed above, lupus impacts both men and women, but [nine out of ten patients with lupus are women](#). If an invention primarily addressed lupus then we would then classify the patent as focused on the health needs of women. Conversely, [“Sleep Apnea” sufferers are three times more likely to be men than women](#). Thus, patents addressing “Sleep Apnea” would be classified as male focused. Patents that address “hip replacement” would be marked as neither male- nor female-focused, [since the procedure occurs at essentially the same rate for both sexes](#). Patents that describe upstream inventions, like new ways of coating a pill, would also not be marked as male or female focused.

In the case of sex-based anatomical differences (e.g., patents focused on “testicles” or “fallopian tubes”) we would skip the review and simply mark the patent as female/male focused based on the anatomical difference. Similarly, if the patent explicitly stated that it was targeting conditions that disproportionately impact men or women, we would mark it as such. Finally, in cases where a patent clearly indicates that it treats multiple conditions that disproportionately impact either sex (e.g., a drug that can treat both “PMS” and “male sexual dysfunction”), we mark the patent as both male and female focused.

Table S-7 shows the percentage of patents focused on the medical needs of women, men, or both, separated by the patents’s MTI-assigned MeSH tags. When a patent is neither assigned the male nor the female tag it addresses majority-female medical needs 5% of the time and majority-male medical needs 6% of the time. In contrast, when the patent is tagged as male, it addresses topics that disproportionately impact men 57% of the time; female-tagged patents address topics that disproportionately impact women 62% of the time. When tagged with both sex tags, the patent is male or female focused roughly 25% of the time and explicitly address both sexes only 16% of the time. Of the roughly 40% of patents that are tagged as female or male, but that are not sex focused, it seems they get the tag because they list sex-specific outcome data or incidentally mention the words “male,” “female,” “woman,” or “man.” We also find standard text-analysis errors, such as where the MTI picks up words that are associated with men or women but used in a different context. For example, “sheath” is regularly tagged as male when it should not be, because male-focused patents are much more likely to use the phrase “penile sheath” and thus the word “sheath” than female-focused patents.

Though the samples are small, we also checked if there is any evidence that patents by women are more or less likely to be female focused when tagged with the female MeSH tag. We find no such evidence ($p = 0.25$). Similarly, we find no difference by inventor gender in the probability that a patent is male focused when tagged with male MeSH tags ($p = 0.33$). This lack of bias echoes the findings described in S2, which shows that the MTI is unbiased when compared to how human indexers apply the sex MeSH tags. This unbiased measurement error biases our findings towards zero, implying our estimates of the female inventor-invention link are likely conservative.

When we take into account these misclassification rates, we still find that the overall percentage of female focused patents hovers around 12%. Using these rates, we expect 62% of the just under

13% of female-tagged patents to be female focused, reducing the number of *actually* female focused patents to about 8%. However, the results in Table S-7 suggest that 5% of non-sex-tagged patents are actually female focused. Given that roughly 80% of patents are not tagged as male or female, this suggests that there are 4% more female focused patents that are not tagged as such by the MTI. Putting the two estimates together yields an overall rate of roughly 12%. The same arithmetic holds for male focused patents. Even if the levels were off by a third, the difference between female and male remains unchanged. Therefore the back-of-the-envelope calculations we show in S13 would still suggest that the lack of female inventors might have led of thousands of lost female focused inventions.

To summarize, we find that the majority of patents tagged as female or male by the MTI are, in fact, focused on diseases or conditions that tend to impact women or men. The differences between patents with no sex tags and those tagged as male or female is substantial. Being tagged as male/female increases ten-fold the chance that an invention is male/female focused. Put in terms of evaluation accuracy, patents tagged as female or male have F_1 scores of just over 73% when it comes to classifying patents as male or female focused, a rate similar to the MTI indexer’s ability to apply the sex MeSH tags as human indexers would (though with flipped precision and recall rates).

Finally, Table S-7 suggests caution when interpreting patents that are assigned both sex tags. It appears that when assigned both tags, the patents are more likely to actually benefit one sex or the other rather, than to target sex-focused conditions that impact both sexes. In our case, since our interest lies in whether a patent is female focused, this distinction is less of a concern. Regardless, in Appendix S7 Table S-21 we show that our findings hold when we mark patents as female focused *only* if the female check tag is present and the male check tag is not.

S-3.3 Patents tagged as female/male address diseases with higher male/female incidence

If our second approach marks patents as either female or male focused, our third approach quantifies not just whether a patent disproportionately benefits women/men, but how many more women/men stand to benefit from a female/male tagged invention. To do so, we build a crosswalk from the set of diseases in the MeSH ontology to the disease topics in the Institute of Health Metrics and

Evaluation’s Global Burden of Disease database (GBD).² The GBD database measures yearly country-level incidence by hundreds of disease topics (41).³ Crucially, its incidence numbers are disaggregated by sex. Given that we study US patents, we use incidence estimates for the US.

To build the link between MeSH and GBD we had a research assistant go through the thousands of MeSH terms on the “Disease[C]” branch of the ontology and, when possible, match each MeSH term to the appropriate GBD disease topic. Where the research assistant was unsure, they marked them as such, and we adjudicated the decision. S14 reports our mapping from MeSH terms to GBD disease topics. The result is that, for each disease MeSH term, we know the GBD topic(s) it matches to and the annual estimated incidence by gender.

Using this crosswalk (Appendix S16), we construct a patent/GBD-topic dataset. Each row represents a GBD topic that our crosswalk says a patent addresses. We calculate the male and female incidence using the GBD estimates from the same year as the patent.⁴ The resulting dataset includes 662,727 patent/GBD-topic observations.

In Table S-8 we show that patents tagged as male/female are much more likely to address diseases that impact more men/women. In Model 1 we regress the logged female incidence count on whether the patent is tagged as female. We include the logged male incidence count to account for the possibility that female tagged patents might simply focus on diseases that afflict more women *and* more men. We find that female-tagged patents address diseases that impact 110% more women than patents without the tag. In Model 2 we also include a dummy for whether the patent is male focused. Doing so merely increases the magnitude on whether a patent is female tagged to 130%. Models 3 and 4 are similar, but test the effect of being tagged as male on the logged male incidence. Though the effect sizes are smaller, we again find that male-tagged patents address diseases that impact 37% to 73% more men than women. The average female- or male-tagged patent is much more likely to benefit that sex.

²<http://www.healthdata.org/gbd>

³Here we analyze incidence, the total number of women with the condition, as against the incidence rate, which measures the share of women with a given condition.

⁴The GBD only goes back to 1990. We therefore use the 1990 incidence rates for all pre-1990 patents.

S-3.4 Female/male tagged patents are more likely to be evaluated by female/male only medical trials

Our fourth approach uses a patent’s text to predict the probability that the invention described would be tested with a female-only or male-only clinical trial. Scientists and doctors regularly run trials on new interventions, drugs, or practices. As part of the trial design, they must decide on whether the trial recruits only female subjects, male subjects, or subjects of both sexes. On the one hand, these choices might still reflect erroneous gender and sex biases by doctors and scientists (12, 17). Indeed, before 1986 the NIH recommended that clinical trials exclude women. On the other hand, the NIH Revitalization Act of 1993 changed this rule and required the NIH to ensure that women and minorities were included in any relevant clinical trials. Recent years have seen a shift towards increasing diversity and representation amongst trial participants. This shift suggests that, at least for trials from the late 1990s onwards, the choice to include only men or only women in a trial reflects who doctors and scientists think will most benefit from the intervention, drug, or practice being tested.

To estimate the probability that an invention is more likely to be tested with a female-only or male-only trial, we rely on a semi-supervised transfer learning approach (42, 43). First, we take the full text from all the patents in our sample, along with the titles and abstracts from all publications from PubMed. Using this corpus of 6.6 billion words (comprising 3.72 million unique terms), we then estimate a 100-dimensional word representation using fastText.⁵ This approach, treating words as points in a high-dimensional vector space, has been successfully used and validated on similar biomedical data (44). We find that our simple word-embedding model reflects semantic space in a relatively rich way. For example, removing the word vector for “women” from “breast” and adding “men” yields a vector that is closest to the word “prostate,” capturing the similarity of two types of cancer that especially impact women and men. While we hope that future work refines and improves on this approach, prior work has demonstrated that these word-embedding approaches are relatively robust, yielding broadly similar results even when fed different types and quantities of data or fit using different parameters (45).

We then use this word-embedding model in conjunction with data from `clinicaltrials`.

⁵We used fastText’s (<https://fasttext.cc>) default model parameters, including the use of the simpler skipgram model to capture differences in word context.

gov on 353,500 clinical trials that were started between 1994 and 2020. For each trial, we know whether it recruited men (16,175), women (34,656), or both sexes (302,659). For each trial, we concatenate its title, summary text, list of conditions, and medical keywords into a single piece of text. These trials range from tests of “Surgery in Treating Patients with Prostate Cancer” (male only subjects) to “Intravenous Immunoglobulin Therapy in Optic Neuritis” (both sexes) to “Vaccine for Ovarian Cancer” (female only). While the female/male-only trials primarily focus on diseases that only impact women/men there are examples where the trials only enroll one sex even though the disease affects both. For example, a trial entitled “Impact of Sleep Disordered Breathing in Older Adults” decided to only enroll men, and the trial “Tailored Treatments of Fibromyalgia” decided to only enroll women, consistent with the fact that sleep disorders are more common in men and fibromyalgia is more common in women.

We then use fastText’s supervised learning algorithm—a clever combination of the word representations and straightforward multinomial logistic regression—to train two models using this trial data, one that uses the trial text to predict whether the trial recruited only men and another that predicts whether the trial recruits only women. In both cases, the models are fed the 100-dimensional word representation we built using the patent and PubMed data. While “transferring” these word representations does slightly improve model accuracy when predicting the enrollment sex of clinical trials, our primary aim is to improve the ability of our clinical-trial-trained models to predict whether the idea described in a patent, or PubMed abstract, is more or less likely to be evaluated with a female-only or male-only trial. By relying on the the Patent-PubMed word representation we implicitly map the clinical-trial text into the semantic space that reflects text from patents and PubMed abstracts, which in turn should improve the generalizability of these models for these texts.

To train and test our models, we randomly selected 340,000 trials as a training set and 13,500 clinical trials to serve as a test set. To be clear, this test set allows us to test the models precision/recall for clinical-trial data, but it does not tell us the accuracy when the algorithm is fed patent text. We find that that our models do exceptionally well at predicting the enrollment sex for clinical trials, with both models yielding precision and recall rates of 98% on the test set. Even when we account for label imbalance, and test our models on a sample that has an equivalent number of female/male and non-female/non-male trials, we find precision and recall rates of 86%

for our male-only model and 94% for our female-only model. The textual content describing a clinical trial appears to be a strong predictor of whether the trial is likely to enroll only men or only women.

We then feed the first 2,500 characters of each patent’s title, abstract, and summary—the same text we fed to the MTI—through our two models. Table S-9 shows the estimated probabilities of a female-only trial for five randomly selected patents from each decile of the predicted female-only-trial distribution. The table also lists the male-only-trial predicted probability, the patent’s title, and a column indicating whether, after human review of the patent’s text, the invention focuses on the medical needs of women. For example, the third patent mentions “feminine libido” in the title, and indeed reading the patent reveals that it is female focused. While the title of the top patent “Treatment of climacteric disorders with nitric oxide synthase substrates and/or donors” does not jump out as female focused, the text of the patent makes it clear that it is: the invention addresses conditions stemming from menopause, including hot flashes and female urogenital discomfort. The patent “Connection mechanisms for uterine mobilizer” focuses on “gynecological” applications. The patent “Ultrasound device for use in a thermotherapy apparatus” is for treatment of breast cancer. Looking at Table S-9, it is clear that patents with higher estimated probabilities are, in fact, inventions that are more likely to be tested with women.

Similarly, Table S-10 shows the estimated probabilities for five randomly selected patents from each decile of the predicted male-only-trial distribution. Again, we find evidence that our algorithm trained with clinical trial data generalizes relatively well to our patent data. While the top patent’s title “Certain phosphomethyl...” does not jump out as male focused, the patent text makes clear that the invention address prostate cancer. The patent “Implantable penile prosthesis” is clearly male focused. Overall, both Tables S-9 and S-10 lend support to the idea that our trial-population sex estimates capture meaningful differences in who benefits from an invention.

Finally, in Table S-11 we regress our estimate for whether an invention is more likely to be tested with a female-only trial on the MTI-assigned sex tags. In Model 1 we find that the estimated female-trial probability increases by 13.1 percentage points when the female MeSH tag is present. Given that the baseline probability is 4 percent, this effect reflects a 428% increase. In Model 2 we add in the male MeSH tag and find that the presence of the male tag reduces the probability of the invention’s being tested with a female-only trial by 3.6 percentage points—essentially reducing that

probability to zero. Model 3 dichotomizes our dependent variable at 80% to test if the check tag is applied to the inventions most likely to be tested with a female-only trial. We again find similar patterns, with the female MeSH tag increasing the probability by 9.9 percentage points from 0.21%, a 48-fold increase.

Table S-11 Columns 4-6 show similar models, but for our male-only trial estimates. Patents tagged as male are much more likely to be tested with male-only trials, with the relative effect in Column 6 reflecting a 21-fold increase from a baseline of 0.23%. That said, the association, though strong in and of itself, is weaker than the female estimates. There are a myriad of reasons why this might be, ranging from the idea that there may be more female-only biomedical conditions than male-only conditions to the notion that “male” is the default sex in medicine, which in turn makes it hard to separate male-focused inventions from “sex-neutral” ones.

Finally, it is worth noting differences and similarities in the MeSH and clinical-trial measures. While the MeSH tags suggest that just over 10% of patents are male/female focused, our trial-based measure is more conservative, suggesting that the rate is closer to a few percentage points. This difference is likely because this clinical-trial-based measure captures clear sex differences (e.g., trials for prostate cancer versus gestational diabetes), while our MeSH measure also picks up on more subtle differences (e.g., Parkinson’s versus lupus). That said, both measures suggest that the sex-focus of inventions is split roughly evenly between the sexes. This is quite different than the trial data, where female-only trials outnumber male-only trials by two to one. We hope that future work explores this striking difference between the sex focus of inventions and of trials.

S-4 Inventor gender classification

We used dictionary matching to assign gender to inventor names. We followed the dictionary-matching approach that Jensen et al. (26) describe in the supplement to their article. We differed slightly in the data sources for our dictionary, which we detail below. We assign gender only when the name in question maps to male or female at least 95 percent of the time it appeared in our dictionary. With this method, we could identify the gender of at least one inventor on 98% of patents, the lead inventor on 92% and the entire team on 80%. This measure is necessarily a proxy, but one that follows practice in other innovation studies.

It is worth noting that after we began this project, PatentsView published a gender assignment for each inventor (<http://patentsview.org/download>). Our classification results correlate with PatentsView’s at above 0.98, and using their measure does not change our findings.

It is also worth noting that our estimates rely on a binary definition of gender, though for many this dichotomization does not apply. We hope future work explores increasingly nuanced ways to measure an individual’s gender. Such measures would allow us to better estimate biases and inequities faced by individuals from across the gender spectrum.

Table S-12 reports the proportion of patents for which we could assign gender to all of the inventors as function of the number of inventors listed on the patent, as well as for U.S.-based versus non-U.S.-based teams. One can readily see that our ability to identify the gender of all members of the team declines with team size. Our gender-identification algorithms also perform better among U.S.-based teams of inventors. As with many current algorithms, the majority of our non-matched records consist of Asian names.

We use the following sources for inventor gender assignment:

- United Kingdom Intellectual Property Organization (46)

Available <https://www.gov.uk/government/publications/gender-profiles-in-worldwide-patenting-an-analysis-of-female-inventorship>

Description 102,777 unique names, of which 63,121 are female and 39,656 are male

- World Intellectual Property Organization (47)

Available <http://www.wipo.int/publications/en/details.jsp?id=4125>

Description 289,452 unique name-gender-nationality records, of which 157,066 are female, 112,207 are male, and 20,183 are undetermined. Combines records from the US Social

Security Administration and Census Bureau, the Alberta government, the UK Office for National Statistics, Statistics Sweden, Spain’s Instituto Nacional de Estadística, France’s Institut National de la Statistique, and Denmark Statistics

- US Social Security Administration

Available <https://www.ssa.gov/oact/babynames/limits.html>

Description 1,924,665 names (97,310 unique), of which 1,138,293 are female (67,046 unique) and 786,372 are male (40,927 unique)

- Florida Voter Registration

Available <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/UBIG3F>

Description 13,710,231 names (545,396 unique), of which 7,196,185 are female (368,313 unique), 6,160,967 are male (194,150 unique), and 352,075 are undetermined (56,567 unique)

- New York City Baby Names

Available <https://catalog.data.gov/dataset/most-popular-baby-names-by-sex-and-mothers-ethnic-group-new-york-city-8c742>

Description 11,345 names (3,016 unique), of which 5,806 are female (1,629 unique) and 5,539 are male (1,430 unique)

- genderize.io

Available <https://genderize.io>

Description Gender information on 4,000 additional unique names. We kept the gender information only for names for which there were at least 20 samples in the database and that were assigned to one gender at least 95% of the time

- GenderAPI

Available <https://gender-api.com>

Description Gender information on 1,249 additional unique names. We kept the gender information only for names for which there were at least 20 samples in the database and that were assigned to one gender at least 95% of the time

S-5 Regression tables corresponding to Figure 4A

Here we report the regression tables corresponding to Figure 4A in the body of the paper along with the estimates that correspond to the analysis of heterogeneity presented in S9. Table S-13 shows the point estimates and standard errors from our baseline model. All models include fixed effects for the patent year interacted with the patent’s subcategory and for the patent year interacted with the count of inventors listed on the patent (team size). We include the year $\times$ subcategory fixed effects to account for potentially time-varying differences in the gender focus of drugs, surgery, biotech, and other subcategories of inventions. This is especially important because the rise of female inventors has been concentrated in drug patents, where female-majority teams account for 25% of inventions in 2010, and has been stubbornly flat for Surgery and Instruments inventions, where the rate remains at 10% (S9). Yet drug patents are much less likely to be sex-focused than Surgery and Instruments inventions. Thus, even if patents by women are more likely female-focused within both types of invention, these opposing likelihoods may dampen the magnitude of the underlying female inventor-invention link (i.e., Simpson’s paradox). We include year $\times$ team-size fixed effects to account for the fact that larger teams mechanically have a higher chance of having at least one female inventor and because team sizes have been growing in the sciences (22).

Tables S-14, S-15, and S-16 show the estimates after exactly matching on a patent’s year, subcategory, and narrow disease area. For example, we built column 1 in Table S-14 by first restricting the sample to those patents with either all-male or female-minority inventor teams. We then match each female-minority patent to a male patent from the same year and subcategory, with the same number of inventors and the same narrow disease area. The latter are level-four MeSH terms from the “Disease[C]” branch of the MeSH ontology and include terms like “Atrial Flutter [C14.280.067.248],” “Atrial Fibrillation [C14.280.067.198],” and “Pre-Eclampsia [C13.703.395.249].” By way of contrast, these narrow disease areas are nested within broader level-one, -two, and -three terms like “Neoplasms [C04],” “Heart Diseases [C14.280],” and “Hypertension, Pregnancy-Induced [C13.703.395].” Our findings also hold when we match on these broader MeSH terms. After matching the data, we then fit a model that includes disease $\times$ year $\times$ subcategory $\times$ team-size fixed effects. We weight observations with the matching weights. Columns 2-8 in Table S-14 then report models with the same structure but that first restrict the data to the indicated sub-

sample before matching. Tables S-15 and S-16 repeat the exercise for patents with majority-female invention teams and all-female invention teams.

S-6 Female inventors are neither more nor less likely to invent for men

Figure S-4 replicates Figure 4A in the main paper and Figure S-5 discussed in S9, but predicts not whether a patent is female-focused, but whether it is male-focused. We find relatively well-estimated zeros across the different models and subsamples. It does not appear that female inventors are more likely to invent for both men and women. Tables S-17, S-18, S-19, and S-20 report the regression tables that correspond to the estimates in Figure S-4. See the preceding section for more details about these regressions and the matching process.

S-7 Robustness to alternative modeling assumptions, text processing, and dependent variables

We conducted several robustness checks to test whether our results are robust to alternative modeling assumptions, data processing decisions, and alternative measures of a patent’s female focus. The first two columns in Table S-21 report our baseline findings, which use a linear probability model. Column 1 includes the standard year, team-size, and subcategory fixed effects. Column 2 is similar but also adds in narrow disease-area fixed effects.⁶ The next two columns show that these results hold when we use logistic regression instead of OLS. Columns 5 and 6 show our results are largely unchanged if we classify patents as female-focused if (1) the patent is classified as female-focused by the MTI and (2) is NOT classified as male-focused by the MTI. The final two columns show similar patterns when we use logistic regression and the female-only measure.

Table S-22 shows that our findings are robust to how much text we feed to and what options we select for the MTI algorithm. Column 1 shows estimates when we rely on the first 2,500 characters of the patent’s title, abstract, and summary text (as we do in Figure 4A). Column 2 adds disease×year fixed effects. The models reported in columns 3 and 4 are similar but rely *only* on the title and abstract, again cutoff at 2,500 characters. The estimates are slightly smaller, but the pattern holds. Models 5 and 6 rely on MeSH terms produced using the MTI’s “strict” filtering option and the first 2,500 characters from the title, abstract, and summary text. The strict option emphasizes precision by returning many fewer terms and using more complex word-sense-disambiguation algorithms. The disambiguation algorithms make the MTI much slower when using the strict options. As a result, it is infrequently used by researchers and by the National Library of Medicine. We again find similar, though somewhat smaller, results. Given that in S2 we find that the MTI algorithm has high precision for the “Male” and “Female” check tags, the strict filtering option may yield an overabundance of false negatives. Finally, columns 7 and 8 again use the regular filtering options but use MeSH terms produced from feeding the MTI 10,000 characters of a patent’s title, abstract, and summary text. Our pattern of results holds; if anything, the effects are larger. This suggests

⁶We find similar results if we match and then estimate with fixed effects, instead of just including fixed effects. However, we largely rely on fixed effects in our robustness checks for the sake of simplicity of computation and reporting. See the next section for more detail on how the fixed-effects estimates compare to the models that first match and then include fixed effects.

that trimming our analysis to the first 2,500 characters might lead us to understate the female inventor-invention link, especially for all-female invention teams.

Our findings are also robust if we limit our analysis to patents that are clearly focused on “humans” and not on inventions that might instead target other animals (e.g., improved cow-milking devices or castration devices for bulls). In Table S-23 Columns 1 and 2 we show that our results hold when we restrict our sample to all patents that are tagged by the MTI with the MeSH term “humans”—though this potentially excludes many pharmaceutical patents that target particular diseases but might not invoke human subjects or anatomy in great detail. Our results strengthen. In Columns 3 and 4 we show that our results hold if we exclude any patent that is tagged by the MTI with the MeSH term “animals.” This would include breast cancer inventions describing prior work completed on mice. Again, our results are if anything slightly larger.

Our results also hold if we use alternative measures of a patent’s sex focus. Model 1 in Table S-24 regresses our measure of female incidence for each disease a patent addresses on the gender composition of the inventor team (See Appendix S3 for further details on how we construct this measure). As with our the female MeSH tag, we find a clear dose-response relationship, with minority-female teams addressing diseases that impact 4% more women, majority-female teams addressing diseases that impact 7% more women, and all-female teams 16% more women. Model 4 is similar but focuses on log male incidence. We find that patents with all-female teams address diseases that impact 12% fewer men. Women are not merely doing more applied research, but appear to be especially likely to produce inventions that target diseases that afflict more women.

Model 2 in Table S-24 regresses our estimate of whether the patent describes an invention that would be tested with a female-only clinical trial on the gender composition of the inventor team (Again, See Appendix S3 for further details on how we construct this measure). We again see a dose-response relationship. Given that the average probability is just over 5%, the effect for all-female teams, 2.8 percentage points, represents a healthy 50% increase. In column 3 we show that this result holds when we dichotomize our prediction of whether the invention will be tested with a female-only clinical trial at 80%. We find similar results, with an estimated increase of 1.6 percentage points off a baseline of 1.1%, a relative increase of nearly 150%. Models 5 and 6 follow the structure of models 2 and 3 but test whether women invent for men. We find no such evidence; if anything, there is modest evidence that women are less likely to build inventions that would

particularly benefit men.

Finally, we replicate the complete set of findings presented in Figure 4 of the paper and in Figure S-5 using our measure of whether an invention is more likely to be tested with a female-only clinical trial. Tables S-25, S-26, S-27, and S-28 present the regression results corresponding to our analysis of heterogeneity along with use of disease matching and fixed effects. We find an almost identical pattern of results, with the relative effect sizes largely similar. For example, after matching we find an estimate for all-female teams in Model 1 of S-28 of 1.6 percentage points, just over a 30% increase over the baseline rate, and still sizeable when compared to the 50% relative effect size we get without matching. The only notable difference is that, in Table S-25, the effect size is larger for corporate patents than for non-corporate patents. However, once we include disease-year-subcategory-team-size fixed effects the pattern reverses and, consistent with Figure S-5, we find that the effect size is larger in non-corporate settings.

Finally, it is worth noting that the standard errors we report change little if we cluster them on different combinations of patent year, team size, subcategory, and disease.

S-8 Accounting for selection with additional fixed effects and double selection lasso methods

A key aspect of our analysis is that we show that female inventors are more likely to invent for women across *and* within narrow disease areas. In Figure 4A we show that our findings hold when we match on the patent’s year, subcategory, team size, and disease focus. Table S-29 shows that our findings hold when we instead match on fewer variables. Matching on disease-subcategory (odd-numbered columns) or disease-subcategory-year (even-numbered columns) yields essentially the same estimates. The only notable difference is that the coefficient for minority-female teams becomes somewhat larger and statistically significant.

While our exact-matching analysis is both stringent and simple (48), it does make two crucial simplifying assumption. First, we assume that patents are primarily associated with a single disease area. Second, we assume that we can model diseases as associated or not with with a patent. Instead, patents might regularly address multiple diseases. In this case, if we only control for the disease most associated with the patent, we might fail to capture the multi-dimensional nature of selection in terms of the areas where female inventors work. Further, perhaps there is meaningful variation in how strongly or weakly a patent is associated with a disease. If female inventors work on a more diffuse set of topics, and thus have patents that are more weakly associated with more diseases, then its possible our dichotomous measure linking patents to diseases might lead us astray.

We address the multiple-disease concern in Table S-30. We report fixed-effects models that include fixed effects for up to 10 different disease areas interacted with the year of the patent. The first fixed effect corresponds to the disease most associated with the patent according to the MTI. It is interacted with year to account for potential time-varying heterogeneity. The second fixed effect captures the disease next-most associated with the patent, again interacted with year. If a patent only matches to one disease then we set the value of the second fixed effect to “no matching disease.” The most stringent model accounts for the ten diseases most associated with the patent. While including additional disease fixed effects weakens the effect for minority-female teams, if anything it appears to strengthen the effect for majority- and all-female teams.

We address the strength-of-association concern by relying on the fact that the MTI produces a confidence score for each MeSH term it assigns to a patent. Presumably, when a disease is more

central to the patent, this score will be higher. This corresponds to the disease’s being mentioned more, its different variants and related problems being described, its being mentioned in the title or abstract, and so on. To use this score, we first create a separate variable for each of the thousands of diseases in the MeSH tree that a patent could *potentially* match to. These variables are set to 0 when the MTI does not assign the disease to the patent, and take the logged confidence score when it does.⁷

Unfortunately, standard fixed effects and matching methods are ill-equipped to handle thousands of relatively, sparse continuous predictors. Instead, we turn to double selection lasso methods (49). This approach uses the lasso to select both the variables that drive selection (e.g., the disease areas where we see lots of both female inventors and inventions) and to select variables that serve as useful controls to improve power (e.g., diseases where the baseline rate of female focus is high or low irrespective of inventor composition). Furthermore, the double selection lasso reduces concerns that including so many controls leads to over-fitting, avoids “over-penalizing” controls as compared to a standard lasso model, and lets us fit models where the number of regressors is potentially bigger than the number of observations. At a conceptual level, the method has similarities to propensity score methods, but instead of including the estimated propensity score as a regressor to account for selection, you instead directly include the variables that the lasso algorithm identifies as driving selection.

Table S-31 shows results from models fit using the double selection lasso method. To account for potential time-varying heterogeneity in disease areas and to address the computational constraints of this method, we fit models to each decade of our data separately, lumping the late 1970s together with the 1980s. The models include our standard team-size, subcategory, and year fixed effects. We include our three covariates of interest—whether the team is minority-, majority-, or all-female—and more than 4,000 disease-area predictors that the lasso then selects from. The pattern of results is similar to what we find when using fixed effects and matching. It appears that controlling for the disease most associated with a patent is largely sufficient to account for men’s and women’s sorting into different areas of invention within the biomedical sciences.

⁷We log scores since the distribution is extremely fat-tailed, with many scores close to 0 and some in the tens of thousands.

S-9 Heterogeneity in the female-inventor invention link

Here we replicate Figure 4A in the body of the paper but include additional panels to explore heterogeneity in the female inventor-invention link. Figure S-5 Panels B, C, and D split the sample by decades, to test whether the increase in women’s representation muted the female inventor-invention link (The tables corresponding to Figure S-5 are presented in S5). As women entered more diverse research areas, they may have confronted potentially fewer undiscovered female-focused ideas. While the point estimates shrink by roughly a third between the 1970s-80s (Panel B) and the 2000s (Panel D), none of the differences are statistically significant. Instead the biggest shift is a pronounced dip in the 1990s (Panel C), perhaps related to the aforementioned push by the NIH to focus on women’s health. As of 2010, women were still identifying more new opportunities to invent for women.

The next pair of estimates cut the data by whether the patent is assigned to a corporation or to a non-corporate entity like a university, individual inventor, or the government. Prior work finds that management directs and influences what researchers in corporate labs invent (50). Given the limited representation of women in management, it is likely that female inventors in corporations have less latitude to pursue female-focused opportunities. While we find noisy estimates for minority- and majority-female teams, we do find in panels E and F that all-female teams are 2.4 percentage points more likely to invent for women in non-corporate than in corporate settings across the unmatched and matched estimates ($p < 0.001$; $p = 0.063$).

The final pair of estimates split the data by whether the patents are from the drug (55% of patents) or surgery (35% of patents) subclasses. While pharmaceutical research has seen an influx of female inventors, from 10% majority-female teams in 1976 to 25% by 2010, surgery has remained stubbornly male-dominated, in 1976 just under 10% of patents were from female-majority teams; in 2010 just over 10% were (S9). Figures S-6 and S-7 illustrate these trends along with percent of patents by female-majority and male-majority teams that are female/male-focused. Especially given the history of hostility towards women in surgery (25), female inventors might be especially likely to see opportunities for women, or men especially likely to dismiss them. Indeed, in panels G and H we see that all-female teams are 8.7 percentage points more likely to invent for women in the surgery subcategory, versus 2.3 percentage points in drugs ($p < 0.001$). Further, this difference

remains after matching ($p = 0.036$).

S-10 Building the biomedical publication dataset

Our data on biomedical publications come from the National Library of Medicine’s PubMed database. We use the 2019 version of the PubMed data. This data is commonly used in studies of the science of science (36, 51, 52). We extract each article’s publication year, authors, journal of publication, and associated MeSH terms published or forthcoming from 2002 through 2020. We focus only on original research articles and exclude literature reviews, books, and other non-journal-article entries that are included in Pubmed but unlikely to ever be cited by or commercialized as a patent. While the PubMed data goes back before 2002, it only records each author’s full first name (as opposed to the first initial) after 2001. Following the procedure described in S3, we use the the full first names to assign authors’ genders.

As noted in S2, unlike patents, most articles in the PubMed dataset are assigned about ten MeSH terms by human indexers before being added to the database. After filtering out roughly three million articles where MeSH terms are absent⁸ and articles where we cannot assign author gender we end up with a sample of 5,529,360 research publications. Since our interest is in seeing if women *who are at risk of inventing* are more likely to discover female focused ideas we further restrict our sample to the 2,062,695 articles published in the top 1,000 journals in terms of commercial impact factor (53). Articles published in these journals are the most likely to be cited in or serve as the basis of a patented invention. See Bikard and Marx (53) for further details on the construction of the journal commercial impact factor metric.

We again use the “Female” and “Male” check tags to measure an article’s sex focus. Again, it is worth emphasizing that these check tags are added by human indexers and *not* by the MTI’s algorithm. To measure a patent’s disease area we again use the level-4 disease MeSH terms, as we do in our patent analysis. In the minority of cases where a patent matches to multiple level-four MeSH disease terms, we randomly selected one to use in our analysis.⁹ See S14 for summary statistics.

⁸These non-indexed articles are generally non-biomedical articles about health, for example health-economics papers, that are also included in PubMed.

⁹Unlike the MeSH terms produced by the MTI algorithm, human-assigned MeSH terms are not ranked by the human indexer, so we cannot use a score to choose. That said, the human indexers rarely assign more than ten MeSH terms, whereas the MTI assigns dozens. As a result, articles overwhelmingly match to only a single specific disease.

S-11 Regression table corresponding to Figure 4B

Table S-32 displays the point estimates and standard errors for the models reported in Figure 4B of the paper. Column 1 reports an OLS regression of an article’s female focus on the gender composition of the research team. It includes $\text{year} \times \text{team-size}$ and $\text{year} \times \text{journal}$ fixed effects. Columns 2 through 4 present estimates after exactly matching on $\text{disease} \times \text{year} \times \text{team size}$ and includes fixed effects for the matching variables along with $\text{year} \times \text{team-size}$ and $\text{year} \times \text{journal}$ fixed effects. To match, we take papers with minority-, majority-, and all-female teams and then exactly match them to papers all male teams with the same number of authors, published in the same year, and addressing the same disease area.

S-12 Publication analysis robustness checks

Here we report a number of robustness checks. First, we validate that publications tagged as female or male tend to address women’s or men’s health. Second, we show that female inventors are not more likely to discover for men. Third, we show our results hold if we analyze articles that are more or less “commercializable,” hold under alternative matching schemes, and hold when we analyze shifts overtime or in terms of authorship order. Fourth, we show that our findings hold when we use alternative measures for whether a research article focuses on the needs of women or men. Fifth and finally, we connect our publication and patent analysis to show that patents by women are also more likely to build on female-focused research.

S-12.1 Do female/male tagged publications address the health needs of women/men?

Here we follow the analysis in Appendix S3 to show that female/male tagged biomedical publication are more likely to focus on female/male health needs. Validating that the female/male MeSH tags capture differences in the sex focus of publications is especially important because prior research has relied on these sex tags to measure whether a research article reports the sex of the subjects studied or analyzes heterogeneous effects by sex (39, 54). However, a publication’s sex focus and sex reporting are likely correlated. As (39) note, single-sex studies—such as a research article describing a new diagnostic method for ovarian cancer—*de facto* engage in sex reporting, since the topic clearly indicates subject sex. Thus, while prior work suggests that the female/male MeSH tag reflects whether a patent reports information about sex, it remains unknown whether female/male tagged articles are also meaningfully more focused on the medical needs of women/men.

Tables S-33 and S-34 show the words most associated with the articles tagged as female/male by PubMed indexers. We constructed the list following the weighted logs-odds approach described in S3 and only display terms that occur at least 100 times. We find strong evidence that the words differ in ways that suggest female/male patents are female/male focused. For example, in Table S-33 the top word is cin3, an abbreviation for “Cervical intraepithelial neoplasia,” a form of cervical cancer. The other words include endometriosis, transvaginal, fallopian, and mothers. The same is true for male-tagged patents. The top term in Table S-34 is “iief,” an abbreviation for “International Index of Erectile Function.” The other words include testicular, ejaculation, male,

and psma (prostate-specific membrane antigen). Intriguingly, there are a number of terms related to heart conditions that disproportionately impact men.

In Table S-35 we show that female/male MeSH-tagged publications target diseases that impact more women/men. Using data on disease incidence by sex, described in S3, we map each publication to our incidence data using the disease MeSH tags applied to each publication. To simplify our analysis, we use incidence estimates from the US from 2010. In Column 1 we show that that patents tagged as female address diseases that impact 200% more women than those not tagged as female. This is not the result of female-tagged patents merely addressing higher incidence diseases, because we control for the logged male incidence rate. Column 2 controls for the male MeSH tag. Our results hold; the male MeSH tag predicts that the publication will address diseases that impact fewer women. Models 3 and 4 replicate the first two columns but predict log male incidence. Again, we find that the male MeSH tag predicts that the publication addresses diseases that particularly impact men.

Our final validation exercise uses the algorithm we developed in S-3 to predict the probability that the idea in a publication would be tested with a female- or male-only clinical trial. Tables S-36 and S-37 show that the algorithm appears to generalize well to publications, especially for female focused conditions, correctly estimating that “Vaginal mesh extrusion associated with use of ...” would likely be tested only on women and “Magnetic resonance imaging is a complementary method to stereological measurement of testicular volume” would be tested only on men. We use this algorithm to estimate these probabilities for all publications in our data. In Table S-38 we show that publications tagged as female/male are significantly more likely to describe ideas that would likely be tested with a female/male-only clinical trial. Indeed, Column 3 suggests that publications tagged with the female check tag are an order of magnitude more likely to have an estimated probability of a female-only clinical trail that is greater than 80%.

S-12.2 Are female scientists more likely to discover for men?

Table S-39 replicates Figure 4B in the paper (Table S-32 in this appendix) but uses whether the publication is tagged with the male MeSH tag as the dependent variable. We find little evidence that papers by women are more likely to target the needs of men.

S-12.3 Our results are robust to alternative commercialization potential sample cuts, matching approaches, authorship ordering, and time period subsamples

Table S-45 shows that our results hold when we include publications with more or less commercialization potential. As discussed in S-10, we restrict our primary analysis sample to the top top 1,000 journals in terms of commercial impact factor (JCIF) (53). Columns 1 and 2 in Table S-45 show that our findings hold when we analyze all five million publications regardless of the journal’s JCIF. The first column includes our baseline fixed effects, the second column fixed effects for disease $\times$ year. Columns 3 and 4 show the estimates using our sample of articles published in the top 1,000 JCIF journals. Columns 5 and 6 show the results when we look at articles in the top 500 JCIF journals, Columns 7 and 8 the top 100.

Table S-41 shows that our findings in Figure 4B of the paper (Table S-32 in this appendix) are robust to different matching approaches. Unfortunately, exactly matching on year (18 years), team size (dozens), disease area (of which there are thousands), and journal (1,000) quickly leads to a computationally infeasible 400 million potential combinations. However, we can show that our results hold when we match on the journal (Columns 1-3), instead of the disease area, even when we further include disease $\times$ year fixed effects (Columns 4-6).

Table S-42 explores heterogeneity in our effects, both by time period and by authorship order. For simplicity, we include fixed effects by year for the journal, team size, and disease area in all our models. In Column 1 we test if authorship order matters. We find some evidence that, at least for female-majority teams, articles with female first/last authors are more likely to be female focused. Columns 2 and 3 split this analysis by time period, 2002-2012 and 2013-2020. We find no significant changes across time.

S-12.4 Our publication-analysis results hold when we use alternative female focus measures

Our results are also hold if we use alternative measures of a publication’s sex focus. See S3 for details on these measures. Model 1 in Table S-43 regresses our measure of female incidence for each disease a publication addresses on the gender composition of the authors. Majority- and all-female

teams address diseases that impact roughly 45% more women. Model 4 shows that female scientists are less likely to address diseases that disproportionately impact men.

Model 2 in Table S-43 regresses our estimate of whether the research article describes an idea that would be tested with a female-only clinical trial on the gender composition of authors. We see a clean dose-response relationship. Given that the average probability is just 6.7%, the effect for all-female teams, 2.6 percentage points, represents a healthy 39% increase. In column 3 we show that this result holds when we dichotomize our prediction of whether the idea in the paper will be tested with a female-only clinical trial at 80%. If anything we find stronger results. Models 5 and 6 follow the structure of Models 2 and 3 but test whether women invent for men. We find no such evidence; if anything there is modest evidence that women are less likely to discover ideas that would particularly benefit men.

S-12.5 Patents by women are more likely to build on female focused research

In our final set of publication robustness checks, we test whether patents by women are also more likely to commercialize these female-focused research ideas. If they are, this provides further evidence that increasing the number of female inventors will lead to more female-focused science being incorporated into new inventions and thus more female-focused innovations. Unlike our patent or publication analysis, testing this hypothesis requires (1) mapping patents to the underlying research idea they commercialize and (2) measuring whether the research ideas that the patent commercializes are female-focused. We do so in two ways. First, we look at patent-paper “pairs,” that is, patents where the inventor appears to be commercializing a scientific ideas that they themselves have discovered. By using the the sex focus of the “paired” articles, we can determine whether the patent is commercializing more female-focused ideas. We identify patent-paper pairs using patent-to-paper citations from Marx and Fuegi (55).

To do this, we restrict our attention to citations to articles that appear in the the PubMed database. As described in S9, MeSH terms are applied to articles in PubMed, so we can measure an article’s sex focus using the “Female” check tag. To get at cited papers that are “pairs,” we also restrict the citations to articles where the full name of at at least one inventor appears in the cited article. Finally, we restrict the cited articles to those added by the applicant (not by the examiner) that appear on the patent’s front page, to ensure that the invention fundamentally depends on the

citations.¹⁰

The result is a dataset with 22,666 patents that on average match to three inventor-produced scientific articles. We classify a patent as drawing on female-focused knowledge if the majority of the cited articles are classified as female-focused in PubMed. Models 1 and 2 in Table S-45 show that patents with female inventors who are commercializing their own teams' research are more likely to be commercializing female-focused work.

The second way we measure knowledge inputs is by linking patents to NIH grants. (See (52) for further details and references on the NIH grant system.) The NIH requires researchers to disclose any publications or patents that come out of NIH-grant-funded research. Using the NIH ExPORTER tool,¹¹ we link patents to NIH grants and grants to articles in the PubMed database. Since NIH grants can run for many years and can support research and patents that take decades to produce, we need to be careful to ensure the research is something the patent could plausibly be commercializing. We do so by restricting our analysis to articles associated with the NIH grant but that were published at most 5 years before the patent.

Our final dataset includes 12,834 patents. Each of these patents is linked to an NIH grant that had one or more publications in the five years before the patent. We classify the patent as commercializing female-focused research if 50% or more of the articles coming out of the grant are female-focused. Models 3 and 4 in Table S-45 show that patents by female inventors are substantially more likely to commercialize female-focused NIH-funded research.

¹⁰We also restrict the citations to those with a confidence score of 10. See Marx and Fuegi (55) for further details.

¹¹<https://exporter.nih.gov>

S-13 Back-of-the-envelope calculations of lost female-focused patents

Here we estimate the potential number of lost female-focused patents and ideas that stem from the under-representation of women in invention and discovery. To do so, we assume that the number of patents and the female-focus rate by inventor gender remain constant. We then estimate how many more patents would be female-focused if women and men were equally represented as inventors. While this gives us a crude estimate for the number of lost female-focused patents, it ignores many factors that might move the estimate up or down. As we discuss in the paper, women might displace men from working on female-focused ideas, leading our estimate to be too high. Alternatively, increasing the number of female inventors might lead to an improved allocation of talent, in which there would be both more female-focused inventions and more patents overall. In this case, our estimate would be too low. We hope future work can explore these mechanisms. None of our findings speak to potential changes in patent quality when the inventor gender mix shifts. All that said, understand the potential magnitudes is still useful.

Our first estimate builds on Figures 1 and 2 in the body of the paper and calculates the number of lost female-focused patents by year. For each year, we assume the number of patents stays constant and that the female-focus rate for female-majority and male-majority teams stays constant. We then estimate the number of female-focused patents if 50% of patents came from female-majority teams. The number of lost female-focused patents, pictured in Figure S-8, is simply the difference between this estimate and the actual count. Indeed, in all years we find that there are potentially lost female-focused inventions. Overall, this approach yields an estimate of 3,168 lost female-focused patents. However, it fails to take into account that all-female teams are particularly likely to invent for women, which might bias our estimate downwards.

Our second estimate takes into account the fact that all-female teams are especially likely to invent for women, by using the between and within regression in Figure 4A to estimate the number of lost female-focused inventions. Building off the fact that the mean invention team has 3 inventors in our patent data, we note that, if women were equally represented, then the average team would have 12.5% of patents from all-male, 12.5% from all-female, 37.5% from majority-female, and 37.5% from minority-female teams. In the data, we find that 72% of teams are all-male while 15% are minority-female, 9% are majority-female, and only 4% are all-female (See S12). Using the estimates

from Model 1 in Table S-13 we then calculate the expected number of patents using the observed gender composition of invention teams and the counterfactual version where women are equally represented. We find that equalizing the number of women would have resulted in 6,534 more female-focused patents from 1976 through 2010.

That said, our estimate above fails to account for the sorting of women into more female-focused areas of invention. To account for this, we run the same exercise as above but use our within area estimates from Figure 4A which take into account differences in the disease areas that women work in. Doing so yields an estimate of 3,668 lost patents. This represents roughly 1% of all biomedical patents, an effect size that we think is both meaningful and plausible. It represents an effect size of just under 10%, compared to the just over 50,000 female-focused patents we observe in the data. Further, shifting the direction of existing researchers is non-trivial. (51) finds that it requires quadrupling the amount of funding a scientist receives to get them to shift their research topics by one standard deviation. Any less, and the scientist will continue researching what they already focus on. How large is a one-standard deviation shift in direction? It is the difference between “a virologist deciding which of two closely related viruses to study for their next project.” Our findings suggest that increasing inventor diversity, beyond simply being socially just, may also be an effective way to shift the direction of invention towards the needs of women.

Finally, we complete the same exercise using PubMed scientific articles to get a sense of whether the researcher gender gap has potentially led to a meaningful loss of female-focused “ideas.” Given that the average article from 2002 to 2020 in PubMed has five authors, and again assuming that women and men are equally represented as researchers, we end up with counterfactual gender breakdowns of 3.125% for all-male and -female teams and 48.4375% for majority- and minority-female teams. The observed rates are 34% for all-male teams, 38% for minority-female teams, 23% for majority-female teams, and 5% for all-female teams. This final number is likely the result from homophily among female researchers. Even so, the majority- and minority-female rates are still much lower than what we would expect if the inventor population were evenly split and teams were not formed on the basis of gender.

Using the estimates from Figure 4B, we find that there are potentially 39,658 lost female-focused discoveries amongst articles that could be published in the top 1,000 JCIF biomedical journals due to the research gender gap; 36,450 after accounting sorting by journal and disease area. While

much more research is needed, there appears to be a substantial number of lost inventions and ideas that could benefit women.

S-14 Summary statistics

Here we report summary statistics for the patent and PubMed data.

Table S-46 shows cross-tabs for the number of female-focused and male-focused inventions by the gender composition of the inventor team.

Table S-47 provides summary statistics for the sample we use in Figures 1 and 2. Table S-48 provides summary statistics for the sample we use in Figure 4B of the paper.

We also provide summary statistics for our patent and scientific-article data for the years 2002 through 2010 in Tables S-49 and S-50. This allows a direct comparison on the sex-focus and gender-composition differences over the same time period. Compared to our patent data, there are both more female-focused articles and more women researchers.

S-15 Four example patents along with MTI-assigned MeSH terms

We include four patents here to give the reader a sense of the patent text and why patents are classified as male- or female-focused. We include a patent that matched to neither the male nor the female MeSH terms, a patent that matched only to the female term, a patent that matched only to the male term, and a patent that matched to both. We present the first page of these four patents below along, with matching MeSH terms, match rank, and MTI scores.

- Neither male nor female: Retractable needle syringe
- Male-focused: Gene expression markers for colorectal cancer prognosis
- Female-focused: Methods of diagnosing endometriosis
- Male- and female-focused: Combinations of vasoactive agents and their use in the treatment of sexual dysfunction

S-15.1 Example non-gender-focused patent: Retractable needle syringe US5762635

US005762635A

United States Patent [19]

Pace et al.

[11] **Patent Number:** **5,762,635**

[45] **Date of Patent:** **Jun. 9, 1998**

[54] **RETRACTABLE NEEDLE SYRINGE**

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11209

5,061,249	10/1991	Campbell	604/195
5,098,402	3/1992	Davis	604/195
5,188,601	2/1993	King	604/110
5,190,526	3/1993	Murray et al.	604/110
5,484,414	1/1996	Pace	604/110

Primary Examiner—John D. Yasko
Attorney, Agent, or Firm—Richard L. Miller, P.E.

[21] Appl. No.: **800,956**

[22] Filed: **Feb. 18, 1997**

[51] **Int. Cl.⁶** **A61M 5/00**

[52] **U.S. Cl.** **604/195; 604/218**

[58] **Field of Search** 604/195, 192,
604/187, 198, 110, 218

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[57] **ABSTRACT**

A retractable needle syringe that includes a barrel assembly, a plunger assembly, and a needle assembly. The plunger assembly is movably mounted in the barrel assembly. And, the needle assembly is movably mounted in the barrel assembly and engagable with the plunger assembly, so that after the retractable needle syringe has been used, the plunger assembly is engaged with the needle assembly, the plunger assembly is pulled, and the needle assembly is drawn into the barrel assembly.

20 Claims, 2 Drawing Sheets

patent_mesh_tag_rank_count	patent_mesh_score	mesh_term	mesh_tree_num
1 6023	HUMANS B01.050.150.900.649.313.988.400.112.400.400		
2 5023	SYRINGES E07.877		
3 2025	NEEDLES E07.612		
4 124	EQUIPMENT DESIGN E05.320		
5 74	HEPATITIS A C02.440.420		
6 67	MEDICAL WASTE DISPOSAL D20.944.460.300		
7 63	HEALTH PERSONNEL M01.526.485		
8 58	DRUG USERS M01.169		
9 41	PLASTICS D25.720.716		
10 35	EQUIPMENT AND SUPPLIES E07		
11 35	INSTRUMENTATION		
12 32	PUNCTURES E02.800		
13 21	INVENTIONS J01.897.400		
14 15	SANITATION H02.229.782		
15 9	SKIN A17.815		
16 8	PHYSICIANS M01.526.485.810		
17 7	OCCUPATIONS N01.824.547		
18 6	WOUNDS AND INJURIES C26		
19 6	CONTRACTS I01.880.604.583.090		
20 5	HOUSEHOLD ARTICLES J01.494		
21 4	DENTAL INSTRUMENTS E06.186.501		
22 4	HOUSEHOLD PRODUCTS J01.516		
23 2	COMMERCE J01.219		
24 2	BIOLOGICAL TRANSPORT G03.143		
25 2	POPULATION GROUPS M01.686		
26 1	PHARMACEUTICAL PREPARATIONS D26		
27 1	CREATIVITY F01.752.264		
28 1	LIFE K01.752.400		
29 1	COSTS AND COST ANALYSIS N03.219.151		

S-15.2 Example male-focused patent: Gene expression markers for colorectal cancer prognosis US8367345

US008367345B2

(12) **United States Patent**
Cowens et al.

(10) **Patent No.:** **US 8,367,345 B2**

(45) **Date of Patent:** **Feb. 5, 2013**

(54) **GENE EXPRESSION MARKERS FOR
COLORECTAL CANCER PROGNOSIS**

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(73) Assignees: **Genomic Health Inc.**, Redwood City,
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U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/413,338**

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now Pat. No. 8,153,378, which is a division of
application No. 11/653,102, filed on Jan.
11, 2007, now Pat. No. 7,695,913.

(60) Provisional application No. 60/758,392, filed on Jan.
11, 2006, provisional application No. 60/800,277,
filed on May 12, 2006, provisional application No.
60/810,077, filed on May 31, 2006.

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C12Q 1/68 (2006.01)

(52) **U.S. Cl.** **435/6.14; 435/6.12**

(58) **Field of Classification Search** None
See application file for complete search history.

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(Continued)

Primary Examiner — James Martinell

(74) *Attorney, Agent, or Firm* — Paula A. Borden;
Bozicevic, Field & Francis LLP.

(57) **ABSTRACT**

A method of predicting clinical outcome in a subject diag-
nosed with colorectal cancer comprising determining evi-
dence of the expression of one or more predictive RNA tran-
scripts or their expression products in a biological sample of
cancer cells obtained from the subject.

20 Claims, 1 Drawing Sheet

patent_mesh_tag_rank_count	patent_mesh_score	mesh_term	mesh_tree_num
1	61210	AGED M01.060.116.100	
2	61210	HUMANS B01.050.150.900.649.313.988.400.112.400.400	
3	61210	MIDDLE AGED M01.060.116.630	
4	61210	MALE	
5	60210	COLORECTAL NEOPLASMS C06.405.249.411.307	
6	50166	PROGNOSIS E01.789	
7	34404	COLONIC NEOPLASMS C06.301.371.411.307.180	
8	7053	NEOPLASM STAGING E01.789.625	
9	2600	ADENOCARCINOMA C04.557.470.200.025	
10	2273	RECTAL NEOPLASMS C04.588.274.476.411.307.790	
11	1111	GENETICS H01.158.273.343	
12	1000	NEOPLASM RECURRENCE, LOCAL C23.550.727.655	
13	897	LYMPH NODES A15.382.520.604.412	
14	663	GENETIC MARKERS D23.101.387	
15	391	COLON A03.556.124.526.356	
16	145	THERAPY	
17	102	RECTUM A03.556.124.526.767	
18	73	DISEASE PROGRESSION C23.550.291.656	
19	33	SURGERY	
20	13	UNITED STATES Z01.107.567.875	
21	11	DIAGNOSIS E01	
22	11	DEATH C23.550.260	
23	9	RNA D13.444.735	
24	8	DIAGNOSTIC TESTS, ROUTINE E01.370.395	
25	7	ETIOLOGY	
26	5	EUROPEAN UNION I01.615.500.475	
27	5	CLASSIFICATION L01.100	
28	4	INVENTIONS J01.897.400	
29	4	NEW YORK Z01.107.567.875.075.437	
30	3	METHODS E05.581	
31	2	DECISION MAKING F02.463.785.373	
32	1	TIME G01.910	

S-15.3 Example female-focused patent: Methods of diagnosing endometriosis US8247174

US008247174B2

(12) **United States Patent**
Giudice

(10) **Patent No.:** **US 8,247,174 B2**
(45) **Date of Patent:** **Aug. 21, 2012**

(54) **METHODS OF DIAGNOSING
ENDOMETRIOSIS**

(75) Inventor: **Linda C. Giudice**, Los Altos Hills, CA
(US)

(73) Assignee: **The Regents of the University of
California**, Oakland, CA (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **12/970,576**

(22) Filed: **Dec. 16, 2010**

(65) **Prior Publication Data**

US 2011/0171631 A1 Jul. 14, 2011

Related U.S. Application Data

(63) Continuation of application No. 12/109,099, filed on
Apr. 24, 2008, now Pat. No. 7,871,778.

(60) Provisional application No. 60/914,018, filed on Apr.
25, 2007.

(51) **Int. Cl.**
C12Q 1/68 (2006.01)

(52) **U.S. Cl.** **435/6.1**

(58) **Field of Classification Search** None
See application file for complete search history.

(56) **References Cited**

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of induction of 17 beta-hydroxysteroid dehydrogenase activity by
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Primary Examiner — Christopher M. Babic

(74) *Attorney, Agent, or Firm* — Kilpatrick Townsend &
Stockton

(57) **ABSTRACT**

The present invention provides biomarkers for the diagnosis
and prognosis of endometriosis. Generally, the methods of
this invention find use in diagnosing or for providing a prog-
nosis for endometriosis by detecting the expression levels of
biomarkers, which are differentially expressed (up- or down-
regulated) in endometrial cells from a patient with
endometriosis. Similarly, these markers can be used to diag-
nose reduced fertility in a patient with endometriosis or to
provide a prognosis for a fertility trial in a patient suffering
from endometriosis. The present invention also provides
methods of identifying a compound for treating or preventing
endometriosis. Finally, the present invention provides kits for
the diagnosis or prognosis of endometriosis.

15 Claims, 26 Drawing Sheets

patent_mesh_tag_rank_count	patent_mesh_score	mesh_term	mesh_tree_num
1	43184	FEMALE	
2	43184	HUMANS B01.050.150.900.649.313.988.400.112.400.400	
3	42184	ENDOMETRIOSIS C13.351.500.163	
4	10956	PROGESTERONE RESISTANCE	
5	10955	ENDOMETRIUM A05.360.319.679.490	
6	2940	EMBRYO IMPLANTATION G08.686.784.170.104.500	
7	2603	CYP19A1 PROTEIN, HUMAN	
8	2602	AROMATASE D08.811.682.690.708.170.915.099	
9	2316	PROGESTERONE D04.210.500.745.745.654.829	
10	1680	METHODS E05.581	
10	1680	METHODS E05.581	
11	1650	DIAGNOSIS E01	
11	1650	DIAGNOSIS E01	
12	1327	IGFBP1 PROTEIN, HUMAN	
13	1326	INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 1 D12.776.157.420.250	
14	1109	PELVIC PAIN C23.888.592.612.944	
15	866	RECEPTORS, PROGESTERONE D12.776.826.750.765	
16	780	UTERINE DISEASES C13.351.500.852	
17	683	PERITONEUM A01.923.047.025.600	
18	514	ESTROGENS D27.505.696.399.472.277	
19	467	PROLACTIN D12.644.548.691.525.525	
20	251	8-CHLORO-CYCLIC ADENOSINE MONOPHOSPHATE	
21	250	8-BROMO CYCLIC ADENOSINE MONOPHOSPHATE D13.695.667.138.395.225	
22	237	INFERTILITY C12.294.365	
23	187	CYCLIC AMP D13.695.462.200	
24	154	DOWN-REGULATION G05.308.200	
25	128	BIOMARKERS D23.101	
26	123	PAIN C23.888.592.612	
27	114	UTERUS A05.360.319.679	
28	101	OVARY A05.360.319.114.630	
29	75	APPENDIX A03.556.124.526.209.290	
30	72	MENSTRUATION DISTURBANCES C23.550.568	
31	43	LESSER PELVIS A01.923.600.500	
32	35	ANNEXIN A2 D12.776.157.125.050.060	
33	24	INSULIN D12.644.548.586.200.500.625	
34	23	FERTILITY G08.686.210	
35	20	NEOVASCULARIZATION, PATHOLOGIC C23.550.589.500	
36	15	FIBROBLASTS A11.329.228	
37	12	PHARMACEUTICAL PREPARATIONS D26	
38	12	INSTRUMENTATION	
39	10	COMPACT DISKS J01.897.280.500.668.800.250	
40	9	SYNAPSINS D12.776.631.750	
41	6	INVENTIONS J01.897.400	
42	3	SOFTWARE L01.224.900	
43	2	CENTRAL NERVOUS SYSTEM STIMULANTS D27.505.954.427.220	
44	2	PROTEIN BINDING G02.111.679	
45	2	DIAGNOSTIC TESTS, ROUTINE E01.370.395	
46	1	BIOSYNTHESIS	
47	1	METABOLISM G03	

S-15.4 Example male/female-focused patent: Combinations of vasoactive agents and their use in the treatment of sexual dysfunctions US8287926

US008287926B2

(12) **United States Patent**
Bombardelli

(10) **Patent No.:** **US 8,287,926 B2**

(45) **Date of Patent:** ***Oct. 16, 2012**

(54) **COMBINATIONS OF VASOACTIVE AGENTS AND THEIR USE IN THE TREATMENT OF SEXUAL DYSFUNCTIONS**

(75) Inventor: **Ezio Bombardelli**, Milan (IT)

(73) Assignee: **Indena S.p.A.**, Milan (IT)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/240,016**

(22) Filed: **Sep. 22, 2011**

(65) **Prior Publication Data**

US 2012/0009283 A1 Jan. 12, 2012

Related U.S. Application Data

(60) Continuation of application No. 12/496,194, filed on Jul. 1, 2009, which is a division of application No. 10/563,980, filed as application No. PCT/EP2004/007374 on Jul. 6, 2004, now abandoned.

(30) **Foreign Application Priority Data**

Jul. 11, 2003 (IT) MI2003A1428

(51) **Int. Cl.**
A61K 36/16 (2006.01)

(52) **U.S. Cl.** **424/752**

(58) **Field of Classification Search** None
See application file for complete search history.

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Primary Examiner — Melenie McCormick

(74) Attorney, Agent, or Firm — Young & Thompson

(57) **ABSTRACT**

Combinations of vasoactive substances which are useful in the treatment of sexual dysfunctions associated with poor local blood supply and/or insufficient lubrication are provided. The vasoactive compounds are esculoside, visnadine, forskolin or extracts thereof, purified lipophilic extracts from plants of the genus *Ipomea*, esters of ximenynic acid, icarin or icarin derivatives, amentoflavone, and *Ginkgo biloba* dimeric flavones. The combination of these vasoactive substances is incorporated in gels and lotions designed to be applied to the genital organs. These formulations are useful in inducing erection of the male and female sex organs and enhancing orgasm and sexual performance. The formulations are particularly useful in the treatment of female sexual dysfunctions.

4 Claims, No Drawings

patent_mesh_tag_rank_count	patent_mesh_score	mesh_term	mesh_tree_num
1	8788	FEMALE	
2	8788	ADULT M01.060.116	
3	8788	MALE	
4	8788	HUMANS B01.050.150.900.649.313.988.400.112.400.400	
5	7788	SEXUAL DYSFUNCTION, PHYSIOLOGICAL C13.351.500.665	
6	3059	ORGASM G08.686.784.460	
7	2138	SEXUAL DYSFUNCTIONS, PSYCHOLOGICAL F03.835	
8	1931	PENILE ERECTION G08.686.784.717	
9	1173	SEXUAL BEHAVIOR F01.145.802	
10	1065	THERAPY	
10	1065	THERAPY	
11	767	COITUS F01.145.802.188	
12	692	SEXUAL PARTNERS M01.778	
13	627	SEXUALITY F01.145.802.975	
14	171	ACETYLCHOLINE D02.092.211.111	
15	161	GENITALIA, FEMALE A05.360.319	
16	156	CARDIOVASCULAR AGENTS D27.505.954.411	
17	140	GENITALIA A05.360	
18	111	PHYSICAL EXAMINATION E01.370.600	
19	108	NOREPINEPHRINE D02.092.211.215.746	
20	99	MUSCLE, SMOOTH A10.690.467	
21	97	NEUROTRANSMITTER AGENTS D27.505.519.625	
22	50	CALCITONIN GENE-RELATED PEPTIDE D12.644.400.097	
23	29	GINKGO BILOBA B01.650.940.800.575.912.125	
24	25	VISNADIN	
25	24	CHROMANS D03.633.100.150.240	
26	21	AMENTOFILAVONE	
27	20	BIFLAVONOIDS D03.383.663.283.266.450.190	
28	17	GINKGO BILOBA EXTRACT	
29	17	LUBRICATION E05.830.583	
30	16	PLANT EXTRACTS D26.667	
31	14	BLOOD CIRCULATION G09.330.100	
32	14	MUSCLE, STRIATED A10.690.552	
33	14	IPOMOEIA B01.650.940.800.575.912.250.238.500	
34	13	FLAVONES D03.633.100.150.266.450.260	
35	13	XIMENYNIC ACID	
36	13	NITRIC OXIDE D01.625.550.500	
37	12	OLEIC ACIDS D10.251.355.325.600	
38	11	EMOTIONS F01.470	
39	10	COMMUNICATION F01.145.209	
40	9	COLFORSIN D02.455.849.291.300	
41	9	MUSCLE, SKELETAL A10.690.552.500	
42	7	RELAXATION I03.450.769	
43	5	MYOCYTES, SMOOTH MUSCLE A11.620.520	
44	4	PARASYMPATHETIC NERVOUS SYSTEM A08.800.050.600	
45	4	AUTONOMIC PATHWAYS A08.800.800.060	
46	3	ETIOLOGY	
47	3	CONSTITUTION AND BYLAWS N04.452.150	
48	3	ESCOLIN D09.408.348.250	
49	2	PLANTS B01.650	
50	2	HUMAN BODY I01.076.201.450.560	
51	1	PSYCHOLOGY F04.096.628	
52	1	ESTERS D02.241.400	
53	1	INSTRUMENTATION	
54	1	DRUG COMPOUNDING E05.916.270	
55	1	CALCITONIN D12.644.400.095	

S-16 MeSH-GBD Crosswalk

- **GBD disease cause [MeSH code] MeSH term**
- Acne vulgaris [C17.800.030.150] Acne Vulgaris
- Acne vulgaris [C17.800.794.111] Acne Vulgaris
- Acute glomerulonephritis [C12.777.419.570.363] Glomerulonephritis
- Acute glomerulonephritis [C13.351.968.419.570.363] Glomerulonephritis
- Acute hepatitis A [C02.440.420] Hepatitis A
- Acute hepatitis A [C02.782.687.359.500] Hepatitis A
- Acute hepatitis A [C06.552.380.705.422] Hepatitis A
- Acute hepatitis B [C02.256.430.400] Hepatitis B
- Acute hepatitis B [C02.440.435] Hepatitis B
- Acute hepatitis B [C06.552.380.705.437] Hepatitis B
- Acute hepatitis C [C02.440.440] Hepatitis C
- Acute hepatitis C [C02.782.350.350] Hepatitis C
- Acute hepatitis C [C06.552.380.705.440] Hepatitis C
- Acute hepatitis E [C02.440.470] Hepatitis E
- Acute hepatitis E [C02.782.455] Hepatitis E
- Acute hepatitis E [C06.552.380.705.470] Hepatitis E
- Acute hepatitis [C06.552.380] Hepatitis
- African trypanosomiasis [C03.752.300.900.719] Trypanosomiasis, African
- African trypanosomiasis [C03.752.300.900] Trypanosomiasis
- Age-related and other hearing loss [C09.218.458.341] Hearing Loss
- Age-related and other hearing loss [C10.597.751.418.341] Hearing Loss
- Age-related and other hearing loss [C23.888.592.763.393.341] Hearing Loss
- Age-related macular degeneration [C11.768.585.439] Macular Degeneration
- Alcohol use disorders [C25.775.100] Alcohol-Related Disorders
- Alcohol use disorders [F03.900.100] Alcohol-Related Disorders
- Alopecia areata [C17.800.329.937.122.147] Alopecia Areata
- Alzheimer's disease and other dementias [C10.228.140.380.100] Alzheimer Disease
- Alzheimer's disease and other dementias [C10.228.140.380] Dementia
- Alzheimer's disease and other dementias [C10.574.945.249] Alzheimer Disease
- Amphetamine use disorders [C25.775.225] Amphetamine-Related Disorders
- Amphetamine use disorders [F03.900.225] Amphetamine-Related Disorders
- Anorexia nervosa [F03.400.125] Anorexia Nervosa
- Anxiety disorders [F03.080] Anxiety Disorders
- Aortic aneurysm [C14.907.055.239] Aortic Aneurysm
- Aortic aneurysm [C14.907.109.139] Aortic Aneurysm
- Appendicitis [C01.539.463.099] Appendicitis
- Appendicitis [C06.405.205.099] Appendicitis
- Appendicitis [C06.405.469.110.207] Appendicitis
- Asbestosis [C08.381.483.581.125] Asbestosis
- Asbestosis [C08.381.520.702.125] Asbestosis
- Asbestosis [C24.800.127] Asbestosis
- Ascariasis [C03.335.508.700.100.070] Ascariasis
- Asthma [C08.127.108] Asthma
- Asthma [C08.381.495.108] Asthma
- Asthma [C08.674.095] Asthma
- Asthma [C20.543.480.680.095] Asthma
- Atrial fibrillation and flutter [C14.280.067.198] Atrial Fibrillation
- Atrial fibrillation and flutter [C14.280.067.248] Atrial Flutter
- Atrial fibrillation and flutter [C23.550.073.198] Atrial Fibrillation
- Atrial fibrillation and flutter [C23.550.073.248] Atrial Flutter
- Attention-deficit/hyperactivity disorder [F03.625.094.150] Attention Deficit Disorder with Hyperactivity
- Autism spectrum disorders [F03.625.164.113] Autism Spectrum Disorder
- Bacterial skin diseases [C01.252.825] Skin Diseases, Bacterial
- Bacterial skin diseases [C01.539.800.720] Skin Diseases, Bacterial
- Bacterial skin diseases [C17.800.838.765] Skin Diseases, Bacterial
- Benign and in situ intestinal neoplasms [C04.588.274.476.411] Intestinal Neoplasms
- Benign and in situ intestinal neoplasms [C06.301.371.411] Intestinal Neoplasms
- Benign and in situ intestinal neoplasms [C06.405.249.411] Intestinal Neoplasms
- Benign and in situ intestinal neoplasms [C06.405.469.491] Intestinal Neoplasms
- Benign prostatic hyperplasia [C12.294.565.500] Prostatic Hyperplasia
- Bipolar disorder [F03.084.500] Bipolar Disorder
- Bladder cancer [C04.588.945.947.960] Urinary Bladder Neoplasms
- Bladder cancer [C12.758.820.968] Urinary Bladder Neoplasms
- Bladder cancer [C12.777.829.813] Urinary Bladder Neoplasms
- Bladder cancer [C13.351.937.820.945] Urinary Bladder Neoplasms
- Bladder cancer [C13.351.968.829.707] Urinary Bladder Neoplasms
- Blindness and vision impairment [C10.597.751.941] Vision Disorders
- Blindness and vision impairment [C11.966] Vision Disorders
- Blindness and vision impairment [C23.888.592.763.941] Vision Disorders
- Brain and nervous system cancer [C04.588.614.250.195] Brain Neoplasms
- Brain and nervous system cancer [C04.588.614] Nervous System Neoplasms
- Brain and nervous system cancer [C10.228.140.211] Brain Neoplasms
- Brain and nervous system cancer [C10.551.240.250] Brain Neoplasms
- Brain and nervous system cancer [C10.551] Nervous System Neoplasms
- Breast cancer [C04.588.180] Breast Neoplasms
- Breast cancer [C17.800.090.500] Breast Neoplasms
- Bulimia nervosa [F03.400.250] Bulimia Nervosa
- Cannabis use disorders [C25.775.635] Marijuana Abuse
- Cannabis use disorders [F01.145.610] Marijuana Use
- Cannabis use disorders [F03.900.635] Marijuana Abuse
- Cannabis use disorders [F03.900.643] Marijuana Use
- Cardiomyopathy and myocarditis [C14.280.238.625] Myocarditis
- Cardiomyopathy and myocarditis [C14.280.238] Cardiomyopathies
- Cardiovascular diseases [C14] Cardiovascular Diseases
- Cataract [C11.510.245] Cataract
- Cellulitis [C01.539.800.130] Cellulitis
- Cellulitis [C01.539.830.200] Cellulitis
- Cellulitis [C17.300.185] Cellulitis
- Cellulitis [C23.550.470.756.200] Cellulitis
- Cervical cancer [C04.588.945.418.948.850] Uterine Cervical Neoplasms
- Cervical cancer [C13.351.500.852.593.131] Uterine Cervical Neoplasms
- Cervical cancer [C13.351.500.852.762.850] Uterine Cervical Neoplasms
- Cervical cancer [C13.351.937.418.875.850] Uterine Cervical Neoplasms
- Chagas disease [C03.752.300.900.200] Chagas Disease
- Chagas disease [C03.752.300.900.200.190] Chagas Cardiomyopathy
- Chagas disease [C14.280.238.190] Chagas Cardiomyopathy
- Chlamydial infection [C01.252.400.210.210] Chlamydia Infections
- Chlamydial infection [C01.252.810.301] Chlamydia Infections
- Chlamydial infection [C01.539.778.281.301] Chlamydia Infections
- Chlamydial infection [C12.294.668.281.301] Chlamydia Infections
- Chlamydial infection [C13.351.500.711.281.301] Chlamydia Infections
- Chronic kidney disease [C05.116.198.816.750] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic kidney disease [C12.777.419.080] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic kidney disease [C13.351.968.419.795] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic kidney disease [C18.452.104.816.750] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic kidney disease [C18.452.174.845.750] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic kidney disease [C18.654.521.500.133.770.734.750] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic kidney disease [C19.642.355.480.500] Chronic Kidney Disease-Mineral and Bone Disorder
- Chronic obstructive pulmonary disease [C08.381.495.389] Pulmonary Disease, Chronic Obstructive
- Chronic respiratory diseases [C08.618] Respiration Disorders
- Cirrhosis and other chronic liver diseases [C06.552.630] Liver Cirrhosis
- Cocaine use disorders [C25.775.300] Cocaine-Related Disorders
- Cocaine use disorders [F03.900.300] Cocaine-Related Disorders
- Colon and rectum cancer [C04.588.274.476.411.307.180] Colonic Neoplasms
- Colon and rectum cancer [C04.588.274.476.411.307.790] Rectal Neoplasms
- Colon and rectum cancer [C06.301.371.411.307.180] Colonic Neoplasms
- Colon and rectum cancer [C06.301.371.411.307.790] Rectal Neoplasms
- Colon and rectum cancer [C06.405.249.411.307.180] Colonic Neoplasms
- Colon and rectum cancer [C06.405.249.411.307.790] Rectal Neoplasms

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- Colon and rectum cancer [C06.405.469.158.356.180] Colonic Neoplasms
- Colon and rectum cancer [C06.405.469.491.307.180] Colonic Neoplasms
- Colon and rectum cancer [C06.405.469.491.307.790] Rectal Neoplasms
- Colon and rectum cancer [C06.405.469.860.180.500] Rectal Neoplasms
- Conduct disorder [F03.625.094.300] Conduct Disorder
- Congenital birth defects [C16.131] Congenital Abnormalities
- Congenital heart anomalies [C14.240.400] Heart Defects, Congenital
- Congenital heart anomalies [C14.280.400] Heart Defects, Congenital
- Congenital heart anomalies [C16.131.240.400] Heart Defects, Congenital
- Congenital musculoskeletal and limb anomalies [N/A] N/A
- Cutaneous and mucocutaneous leishmaniasis [C03.752.300.500.400.385] Leishmaniasis, Mucocutaneous
- Cutaneous and mucocutaneous leishmaniasis [C03.858.560.400.385] Leishmaniasis, Mucocutaneous
- Cutaneous and mucocutaneous leishmaniasis [C17.800.838.775.560.400.385] Leishmaniasis, Mucocutaneous
- Cystic echinococcosis [C03.335.190.396.314] Echinococcosis, Hepatic
- Cystic echinococcosis [C03.335.190.396] Echinococcosis
- Cystic echinococcosis [C03.518.314] Echinococcosis, Hepatic
- Cystic echinococcosis [C04.182] Cysts
- Cystic echinococcosis [C06.552.664.272] Echinococcosis, Hepatic
- Cystic echinococcosis [C23.300.306] Cysts
- Cysticercosis [B01.050.500.500.736.215.895.775] Taenia solium
- Cysticercosis [C03.335.190.902.185] Cysticercosis
- Decubitus ulcer [C17.800.893.665] Pressure Ulcer
- Dengue [B04.820.250.350.270] Dengue Virus
- Dengue [C02.081.270] Dengue
- Dengue [C02.782.350.250.214] Dengue
- Dengue [C02.782.417.214] Dengue
- Depressive disorders [F03.600.300] Depressive Disorder
- Dermatitis [C17.800.174] Dermatitis
- Diabetes and kidney diseases [C12.777.419] Kidney Diseases
- Diabetes and kidney diseases [C13.351.968.419] Kidney Diseases
- Diabetes and kidney diseases [C18.452.394.750] Diabetes Mellitus
- Diabetes and kidney diseases [C19.246] Diabetes Mellitus
- Diabetes mellitus [C18.452.394.750] Diabetes Mellitus
- Diabetes mellitus [C19.246] Diabetes Mellitus
- Diarrheal diseases [C06.405] Gastrointestinal Diseases
- Diarrheal diseases [C23.888.821.214] Diarrhea
- Dietary iron deficiency [C15.378.071.196.300] Anemia, Iron-Deficiency
- Dietary iron deficiency [C18.452.565.100] Anemia, Iron-Deficiency
- Digestive congenital anomalies [C16.131.314] Digestive System Abnormalities
- Digestive diseases [C06] Digestive System Diseases
- Diphtheria [C01.252.410.040.246.388] Diphtheria
- Diphtheria [D20.215.894.691.263] Diphtheria Toxoid
- Down syndrome [C10.597.606.360.220] Down Syndrome
- Down syndrome [C16.131.077.327] Down Syndrome
- Down syndrome [C16.131.260.260] Down Syndrome
- Down syndrome [C16.320.180.260] Down Syndrome
- Drug use disorders [C25.775.383] Drug Overdose
- Drug use disorders [E02.319.306.500.500] Drug Overdose
- Drug-susceptible tuberculosis [N/A] N/A
- Dysthymia [F03.600.300.400] Dysthymic Disorder
- Eating disorders [F03.400] Feeding and Eating Disorders
- Ebola [B04.820.455.300.200] Ebolavirus
- Ebola [C02.782.417.415] Hemorrhagic Fever, Ebola
- Ebola [C02.782.580.250.400] Hemorrhagic Fever, Ebola
- Ectopic pregnancy [C13.703.733] Pregnancy, Ectopic
- Encephalitis [C02.182.525] Encephalitis, Viral
- Encephalitis [C02.290] Encephalitis, Viral
- Encephalitis [C10.228.140.430.520.750] Encephalitis, Viral
- Encephalitis [C10.228.140.430] Encephalitis
- Encephalitis [C10.228.228.245.340] Encephalitis, Viral
- Encephalitis [C10.228.228.399.750] Encephalitis, Viral
- Endocarditis [C14.280.282] Endocarditis
- Endocrine, metabolic, blood, and immune disorders [C15.378] Hematologic Diseases
- Endocrine, metabolic, blood, and immune disorders [C18.452] Metabolic Diseases
- Endocrine, metabolic, blood, and immune disorders [C19] Endocrine System Diseases
- Endocrine, metabolic, blood, and immune disorders [C20] Immune System Diseases
- Endometriosis [C13.351.500.163] Endometriosis
- Enteric infections [C06.405.469] Intestinal Diseases
- Epilepsy [C10.228.140.490] Epilepsy
- Esophageal cancer [C04.588.274.476.205] Esophageal Neoplasms
- Esophageal cancer [C04.588.443.353] Esophageal Neoplasms
- Esophageal cancer [C06.301.371.205] Esophageal Neoplasms
- Esophageal cancer [C06.405.117.430] Esophageal Neoplasms
- Esophageal cancer [C06.405.249.205] Esophageal Neoplasms
- Extensively drug-resistant tuberculosis [C01.252.410.040.552.846.775.500] Extensively Drug-Resistant Tuberculosis
- Female infertility [C13.351.500.365.700] Infertility, Female
- Food-borne trematodiasis [C03.335.865] Trematode Infections
- Fungal skin diseases [C01.703] Mycoses
- G6PD deficiency [C15.378.071.141.150.480] Glucosephosphate Dehydrogenase Deficiency
- G6PD deficiency [C16.320.070.480] Glucosephosphate Dehydrogenase Deficiency
- G6PD deficiency [C16.320.565.202.402] Glucosephosphate Dehydrogenase Deficiency
- G6PD deficiency [C18.452.648.202.402] Glucosephosphate Dehydrogenase Deficiency
- G6PD trait [C15.378.071.141.150.480] Glucosephosphate Dehydrogenase Deficiency
- G6PD trait [C16.320.070.480] Glucosephosphate Dehydrogenase Deficiency
- G6PD trait [C16.320.565.202.402] Glucosephosphate Dehydrogenase Deficiency
- G6PD trait [C18.452.648.202.402] Glucosephosphate Dehydrogenase Deficiency
- Gallbladder and biliary diseases [C06.130.564] Gallbladder Diseases
- Gallbladder and biliary diseases [C06.130] Biliary Tract Diseases
- Gallbladder and biliary tract cancer [C04.588.274.120.401] Gallbladder Neoplasms
- Gallbladder and biliary tract cancer [C04.588.274.120] Biliary Tract Neoplasms
- Gallbladder and biliary tract cancer [C06.130.320.401] Gallbladder Neoplasms
- Gallbladder and biliary tract cancer [C06.130.320] Biliary Tract Neoplasms
- Gallbladder and biliary tract cancer [C06.130.564.401] Gallbladder Neoplasms
- Gallbladder and biliary tract cancer [C06.301.120.401] Gallbladder Neoplasms
- Gallbladder and biliary tract cancer [C06.301.120] Biliary Tract Neoplasms
- Gastritis and duodenitis [C06.405.205.462.249] Duodenitis
- Gastritis and duodenitis [C06.405.205.697] Gastritis
- Gastritis and duodenitis [C06.405.469.275.600] Duodenitis
- Gastritis and duodenitis [C06.405.469.326.750] Duodenitis
- Gastritis and duodenitis [C06.405.748.398] Gastritis
- Gastroesophageal reflux disease [C06.405.117.119.500.484] Gastroesophageal Reflux
- Genital herpes [C02.256.466.382.290] Herpes Genitalis
- Genital herpes [C02.800.801.350] Herpes Genitalis
- Genital herpes [C12.294.329] Herpes Genitalis
- Genital herpes [C13.351.500.342] Herpes Genitalis
- Genital prolapse [C13.351.500.852.833] Uterine Prolapse
- Genital prolapse [C23.300.842.624.750] Uterine Prolapse
- Glaucoma [C11.525.381] Glaucoma
- Gonococcal infection [B03.440.400.425.550.550.474] Neisseria gonorrhoeae
- Gonococcal infection [B03.660.075.525.520.400] Neisseria gonorrhoeae
- Gonococcal infection [C01.252.400.625.391] Gonorrhea
- Gonococcal infection [C01.252.810.401] Gonorrhea
- Gonococcal infection [C01.539.778.281.401] Gonorrhea
- Gonococcal infection [C12.294.668.281.401] Gonorrhea
- Gonococcal infection [C13.351.500.711.281.401] Gonorrhea
- Gout [C05.550.114.423] Gout
- Gout [C05.550.354.500] Gout
- Gout [C05.799.414] Gout
- Gout [C16.320.565.798.368] Gout
- Gout [C18.452.648.798.368] Gout
- Guinea worm disease [B01.050.500.500.294.400.937.225.250.250] Dracunculus Nematode
- Guinea worm disease [C03.335.508.700.750.299] Dracunculiasis
- Gynecological diseases [C13.351.500] Genital Diseases, Female
- H influenzae type B meningitis [B03.440.450.600.450.330.150] Haemophilus influenzae type b
- H influenzae type B meningitis [B03.660.250.550.290.330.150] Haemophilus influenzae type b
- H influenzae type B meningitis [C01.252.200.500.450] Meningitis, Haemophilus
- H influenzae type B meningitis [C01.252.400.700.433.615] Meningitis, Haemophilus
- H influenzae type B meningitis [C10.228.228.180.500.425] Meningitis, Haemophilus
- H influenzae type B meningitis [C10.228.614.280.393] Meningitis, Haemophilus
- HIV/AIDS [C02.782.815.616.400.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS [C02.782.815.616.400] HIV Infections
- HIV/AIDS [C02.800.801.400.040] Acquired Immunodeficiency Syndrome

- HIV/AIDS [C02.800.801.400] HIV Infections
- HIV/AIDS [C02.839.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS [C20.673.480.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS [C20.673.480] HIV Infections
- HIV/AIDS and sexually transmitted infections [C01.539.778] Sexually Transmitted Diseases
- HIV/AIDS and sexually transmitted infections [C02.782.815.616.400.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS and sexually transmitted infections [C02.782.815.616.400] HIV Infections
- HIV/AIDS and sexually transmitted infections [C02.800.801.400.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS and sexually transmitted infections [C02.800.801.400] HIV Infections
- HIV/AIDS and sexually transmitted infections [C02.800] Sexually Transmitted Diseases
- HIV/AIDS and sexually transmitted infections [C02.839.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS and sexually transmitted infections [C12.294.668] Sexually Transmitted Diseases
- HIV/AIDS and sexually transmitted infections [C13.351.500.711] Sexually Transmitted Diseases
- HIV/AIDS and sexually transmitted infections [C20.673.480.040] Acquired Immunodeficiency Syndrome
- HIV/AIDS and sexually transmitted infections [C20.673.480] HIV Infections
- Headache disorders [C10.228.140.546] Headache Disorders
- Hemoglobinopathies and hemolytic anemias [C15.378.071.141] Anemia, Hemolytic
- Hemoglobinopathies and hemolytic anemias [C15.378.420] Hemoglobinopathies
- Hemoglobinopathies and hemolytic anemias [C16.320.365] Hemoglobinopathies
- Hemolytic disease and other neonatal jaundice [C16.614.451.500] Jaundice, Neonatal
- Hemolytic disease and other neonatal jaundice [C23.550.429.249.500] Jaundice, Neonatal
- Hodgkin lymphoma [C04.557.386.355] Hodgkin Disease
- Hodgkin lymphoma [C15.604.515.569.355] Hodgkin Disease
- Hodgkin lymphoma [C20.683.515.761.355] Hodgkin Disease
- Hookworm disease [B01.050.500.500.294.400.968.100] Ancylostomatoida
- Hookworm disease [C03.335.508.700.775.455] Hookworm Infections
- Hypertensive heart disease [C14.907.489] Hypertension
- Idiopathic developmental intellectual disability [C10.597.606.360] Intellectual Disability
- Idiopathic developmental intellectual disability [C23.888.592.604.646] Intellectual Disability
- Idiopathic developmental intellectual disability [F01.700.687] Intellectual Disability
- Idiopathic developmental intellectual disability [F03.625.539] Intellectual Disability
- Indirect maternal deaths [C13.703.401] Maternal Death
- Indirect maternal deaths [C23.550.260.730.500] Maternal Death
- Indirect maternal deaths [I01.880.735.607.500] Maternal Death
- Inflammatory bowel disease [C06.405.205.731] Inflammatory Bowel Diseases
- Inflammatory bowel disease [C06.405.469.432] Inflammatory Bowel Diseases
- Inguinal, femoral, and abdominal hernia [C23.300.707.374.750] Hernia, Femoral
- Inguinal, femoral, and abdominal hernia [C23.300.707.374.875] Hernia, Inguinal
- Inguinal, femoral, and abdominal hernia [C23.300.707.374] Hernia, Abdominal
- Interstitial lung disease and pulmonary sarcoidosis [C08.381.483.725] Sarcoidosis, Pulmonary
- Interstitial lung disease and pulmonary sarcoidosis [C08.381.483] Lung Diseases, Interstitial
- Interstitial lung disease and pulmonary sarcoidosis [C15.604.515.827.725] Sarcoidosis, Pulmonary
- Intestinal nematode infections [C03.335.508] Nematode Infections
- Intestinal nematode infections [C03.432] Intestinal Diseases, Parasitic
- Intestinal nematode infections [C06.405.469.452] Intestinal Diseases, Parasitic
- Invasive Non-typhoidal Salmonella (iNTS) [B03.440.450.425.800] Salmonella
- Invasive Non-typhoidal Salmonella (iNTS) [B03.660.250.150.710] Salmonella
- Invasive Non-typhoidal Salmonella (iNTS) [C01.252.400.310.821] Salmonella Infections
- Iodine deficiency [N/A] N/A
- Ischemic heart disease [C14.280.647] Myocardial Ischemia
- Ischemic heart disease [C14.907.585] Myocardial Ischemia
- Kidney cancer [C04.588.945.947.535] Kidney Neoplasms
- Kidney cancer [C12.758.820.750] Kidney Neoplasms
- Kidney cancer [C12.777.419.473] Kidney Neoplasms
- Kidney cancer [C13.351.937.820.535] Kidney Neoplasms
- Kidney cancer [C13.351.968.419.473] Kidney Neoplasms
- Klinefelter syndrome [C16.131.260.830.835.500] Klinefelter Syndrome
- Klinefelter syndrome [C16.131.939.316.795.500] Klinefelter Syndrome
- Klinefelter syndrome [C16.320.180.830.835.500] Klinefelter Syndrome
- Larynx cancer [C04.588.443.665.481] Laryngeal Neoplasms
- Larynx cancer [C08.360.369] Laryngeal Neoplasms
- Larynx cancer [C08.785.481] Laryngeal Neoplasms
- Larynx cancer [C09.400.369] Laryngeal Neoplasms
- Larynx cancer [C09.647.481] Laryngeal Neoplasms
- Late maternal deaths [C13.703.401] Maternal Death
- Late maternal deaths [C23.550.260.730.500] Maternal Death
- Late maternal deaths [I01.880.735.607.500] Maternal Death
- Latent tuberculosis infection [C01.252.410.040.552.846.122] Latent Tuberculosis
- Leishmaniasis [C03.752.300.500] Leishmaniasis
- Leishmaniasis [C03.858.560] Leishmaniasis
- Leishmaniasis [C17.800.838.775.560] Leishmaniasis
- Leprosy [C01.252.410.040.552.386] Leprosy
- Leukemia [C04.557.337] Leukemia
- Lip and oral cavity cancer [C04.588.443.591.550] Lip Neoplasms
- Lip and oral cavity cancer [C04.588.443.591] Mouth Neoplasms
- Lip and oral cavity cancer [C07.465.409.640] Lip Neoplasms
- Lip and oral cavity cancer [C07.465.530.550] Lip Neoplasms
- Lip and oral cavity cancer [C07.465.530] Mouth Neoplasms
- Liver cancer [C04.588.274.623] Liver Neoplasms
- Liver cancer [C06.301.623] Liver Neoplasms
- Liver cancer [C06.552.697] Liver Neoplasms
- Low back pain [C23.888.592.612.107.400] Low Back Pain
- Lower respiratory infections [C01.539.739] Respiratory Tract Infections
- Lower respiratory infections [C08.730] Respiratory Tract Infections
- Lymphatic filariasis [C03.335.508.700.750.361.350] Elephantiasis, Filarial
- Lymphatic filariasis [C03.335.508.700.750.361] Filariasis
- Lymphatic filariasis [C15.604.496.490] Elephantiasis, Filarial
- Major depressive disorder [F03.600.300.375] Depressive Disorder, Major
- Malaria [C03.752.530] Malaria
- Male infertility [C12.294.365.700] Infertility, Male
- Malignant skin melanoma [C04.557.465.625.650.510] Melanoma
- Malignant skin melanoma [C04.557.580.625.650.510] Melanoma
- Malignant skin melanoma [C04.557.665.510] Melanoma
- Maternal abortion and miscarriage [C13.703.039] Abortion, Spontaneous
- Maternal abortion and miscarriage [C13.703.090] Abortion, Threatened
- Maternal and neonatal disorders [N/A] N/A
- Maternal deaths aggravated by HIV/AIDS [C13.703.401] Maternal Death
- Maternal deaths aggravated by HIV/AIDS [C23.550.260.730.500] Maternal Death
- Maternal deaths aggravated by HIV/AIDS [I01.880.735.607.500] Maternal Death
- Maternal disorders [C13.703] Pregnancy Complications
- Maternal hemorrhage [C13.703.420.725] Postpartum Hemorrhage
- Maternal hemorrhage [C13.703.844.700] Postpartum Hemorrhage
- Maternal hemorrhage [C23.550.414.993.850] Postpartum Hemorrhage
- Maternal hypertensive disorders [C13.703.395] Hypertension, Pregnancy-Induced
- Maternal hypertensive disorders [C14.907.489.480] Hypertension, Pregnancy-Induced
- Maternal obstructed labor and uterine rupture [C13.351.500.852.904] Uterine Rupture
- Maternal obstructed labor and uterine rupture [C13.703.420] Obstetric Labor Complications
- Maternal sepsis and other maternal infections [C01.539.674] Pregnancy Complications, Infectious
- Maternal sepsis and other maternal infections [C13.703.700] Pregnancy Complications, Infectious
- Measles [C02.782.580.600.500.500] Measles
- Meningitis [C01.252.200.500] Meningitis, Bacterial
- Meningitis [C01.703.181.500] Meningitis, Fungal
- Meningitis [C02.182.550] Meningitis, Viral
- Meningitis [C10.228.140.430.550] Meningoencephalitis
- Meningitis [C10.228.228.180.500] Meningitis, Bacterial
- Meningitis [C10.228.228.198.500] Meningitis, Fungal
- Meningitis [C10.228.228.245.500] Meningitis, Viral
- Meningitis [C10.228.228.245.550] Meningoencephalitis
- Meningitis [C10.228.228.570] Meningoencephalitis
- Meningitis [C10.228.614.220] Meningitis, Aseptic
- Meningitis [C10.228.614.280] Meningitis, Bacterial
- Meningitis [C10.228.614.300] Meningitis, Fungal
- Meningitis [C10.228.614.400] Meningitis, Viral

- Meningitis [C10.228.614.500] Meningoencephalitis
- Meningitis [C10.228.614] Meningitis
- Meningococcal meningitis [C01.252.200.500.550] Meningitis, Meningococcal
- Meningococcal meningitis [C01.252.400.625.549.449] Meningitis, Meningococcal
- Meningococcal meningitis [C10.228.228.180.500.750] Meningitis, Meningococcal
- Meningococcal meningitis [C10.228.614.280.505] Meningitis, Meningococcal
- Mental disorders [F03] Mental Disorders
- Mesothelioma [C04.557.470.035.510] Mesothelioma
- Mesothelioma [C04.557.470.660.510] Mesothelioma
- Migraine [C10.228.140.546.399.750] Migraine Disorders
- Motor neuron disease [C10.574.562] Motor Neuron Disease
- Motor neuron disease [C10.668.467] Motor Neuron Disease
- Multidrug-resistant tuberculosis without extensive drug resistance [C01.252.410.040.552.846.775] Tuberculosis, Multidrug-Resistant
- Multiple myeloma [C04.557.595.500] Multiple Myeloma
- Multiple myeloma [C14.907.454.460] Multiple Myeloma
- Multiple myeloma [C15.378.147.780.650] Multiple Myeloma
- Multiple myeloma [C15.378.463.515.460] Multiple Myeloma
- Multiple myeloma [C20.683.515.845] Multiple Myeloma
- Multiple myeloma [C20.683.780.650] Multiple Myeloma
- Multiple sclerosis [C10.114.375.500] Multiple Sclerosis
- Multiple sclerosis [C10.314.350.500] Multiple Sclerosis
- Multiple sclerosis [C20.111.258.250.500] Multiple Sclerosis
- Musculoskeletal disorders [C05] Musculoskeletal Diseases
- Myelodysplastic, myeloproliferative, and other hematopoietic neoplasms [C04.588.448] Hematologic Neoplasms
- Myelodysplastic, myeloproliferative, and other hematopoietic neoplasms [C15.378.400] Hematologic Neoplasms
- Nasopharynx cancer [C04.588.443.665.710.650] Nasopharyngeal Neoplasms
- Nasopharynx cancer [C07.550.350.650] Nasopharyngeal Neoplasms
- Nasopharynx cancer [C07.550.745.650] Nasopharyngeal Neoplasms
- Nasopharynx cancer [C09.647.710.650] Nasopharyngeal Neoplasms
- Nasopharynx cancer [C09.775.350.650] Nasopharyngeal Neoplasms
- Nasopharynx cancer [C09.775.549.650] Nasopharyngeal Neoplasms
- Near vision loss [C11.744.786] Presbyopia
- Neck pain [C23.888.592.612.553] Neck Pain
- Neglected tropical diseases and malaria [N/A] N/A
- Neonatal disorders [C16.614] Infant, Newborn, Diseases
- Neonatal disorders [C16] Congenital, Hereditary, and Neonatal Diseases and Abnormalities
- Neonatal encephalopathy due to birth asphyxia and trauma [C16.614.092] Asphyxia Neonatorum
- Neonatal preterm birth [C13.703.420.491.500] Premature Birth
- Neonatal sepsis and other neonatal infections [C01.539.757.580] Neonatal Sepsis
- Neonatal sepsis and other neonatal infections [C16.614.627] Neonatal Sepsis
- Neonatal sepsis and other neonatal infections [C23.550.470.790.500.470] Neonatal Sepsis
- Neoplasms [C04] Neoplasms
- Neural tube defects [C10.500.680] Neural Tube Defects
- Neural tube defects [C16.131.666.680] Neural Tube Defects
- Neurological disorders [C10] Nervous System Diseases
- Non-Hodgkin lymphoma [C04.557.386.480] Lymphoma, Non-Hodgkin
- Non-Hodgkin lymphoma [C15.604.515.569.480] Lymphoma, Non-Hodgkin
- Non-Hodgkin lymphoma [C20.683.515.761.480] Lymphoma, Non-Hodgkin
- Non-melanoma skin cancer [C04.588.805] Skin Neoplasms
- Non-melanoma skin cancer [C17.800.882] Skin Neoplasms
- Non-rheumatic valvular heart disease [C14.280.484] Heart Valve Diseases
- Nutritional deficiencies [C18.654.521] Malnutrition
- Onchocerciasis [C03.335.508.700.750.361.699] Onchocerciasis
- Onchocerciasis [C03.858.650] Onchocerciasis
- Onchocerciasis [C17.800.838.775.690] Onchocerciasis
- Opioid use disorders [C25.775.675] Opioid-Related Disorders
- Opioid use disorders [F03.900.675] Opioid-Related Disorders
- Oral disorders [C07.793] Tooth Diseases
- Orofacial clefts [N/A] N/A
- Osteoarthritis [C05.550.114.606] Osteoarthritis
- Osteoarthritis [C05.799.613] Osteoarthritis
- Other chromosomal abnormalities [C16.131.260] Chromosome Disorders
- Other chromosomal abnormalities [C16.320.180] Chromosome Disorders
- Other non-communicable diseases [N/A] N/A
- Other pharynx cancer [C04.588.443.665.710] Pharyngeal Neoplasms
- Other pharynx cancer [C07.550.745] Pharyngeal Neoplasms
- Other pharynx cancer [C09.647.710] Pharyngeal Neoplasms
- Other pharynx cancer [C09.775.549] Pharyngeal Neoplasms
- Otitis media [C09.218.705.663] Otitis Media
- Ovarian cancer [C04.588.322.455] Ovarian Neoplasms
- Ovarian cancer [C13.351.500.056.630.705] Ovarian Neoplasms
- Ovarian cancer [C13.351.937.418.685] Ovarian Neoplasms
- Ovarian cancer [C19.344.410] Ovarian Neoplasms
- Ovarian cancer [C19.391.630.705] Ovarian Neoplasms
- Pancreatic cancer [C04.588.274.761] Pancreatic Neoplasms
- Pancreatic cancer [C04.588.322.475] Pancreatic Neoplasms
- Pancreatic cancer [C06.301.761] Pancreatic Neoplasms
- Pancreatic cancer [C06.689.667] Pancreatic Neoplasms
- Pancreatic cancer [C19.344.421] Pancreatic Neoplasms
- Pancreatitis [C06.689.750] Pancreatitis
- Paralytic ileus and intestinal obstruction [C06.405.469.531.492.500] Intestinal Pseudo-Obstruction
- Paralytic ileus and intestinal obstruction [C06.405.469.531] Intestinal Obstruction
- Paratyphoid fever [C01.252.400.310.821.438] Paratyphoid Fever
- Parkinson's disease [C10.228.140.079.862.500] Parkinson Disease
- Parkinson's disease [C10.228.662.600.400] Parkinson Disease
- Parkinson's disease [C10.574.812] Parkinson Disease
- Peptic ulcer disease [C06.405.469.275.800] Peptic Ulcer
- Peptic ulcer disease [C06.405.748.586] Peptic Ulcer
- Peripheral artery disease [C14.907.137.126.307.500] Peripheral Arterial Disease
- Peripheral artery disease [C14.907.617.671] Peripheral Arterial Disease
- Pneumococcal meningitis [C01.252.200.500.600] Meningitis, Pneumococcal
- Pneumococcal meningitis [C01.252.410.890.670.595] Meningitis, Pneumococcal
- Pneumococcal meningitis [C10.228.228.180.500.875] Meningitis, Pneumococcal
- Pneumococcal meningitis [C10.228.614.280.560] Meningitis, Pneumococcal
- Pneumoconiosis [C08.381.483.581] Pneumoconiosis
- Pneumoconiosis [C08.381.520.702] Pneumoconiosis
- Pneumoconiosis [C24.800] Pneumoconiosis
- Polycystic ovarian syndrome [C04.182.612.765] Polycystic Ovary Syndrome
- Polycystic ovarian syndrome [C13.351.500.056.630.580.765] Polycystic Ovary Syndrome
- Polycystic ovarian syndrome [C19.391.630.580.765] Polycystic Ovary Syndrome
- Premenstrual syndrome [C23.550.568.968] Premenstrual Syndrome
- Prostate cancer [C04.588.945.440.770] Prostatic Neoplasms
- Prostate cancer [C12.294.260.750] Prostatic Neoplasms
- Prostate cancer [C12.294.565.625] Prostatic Neoplasms
- Prostate cancer [C12.758.409.750] Prostatic Neoplasms
- Protein-energy malnutrition [C18.654.521.500.708.626] Protein-Energy Malnutrition
- Pruritus [C17.800.685] Pruritus
- Pruritus [C23.888.885.625] Pruritus
- Psoriasis [C17.800.859.675] Psoriasis
- Pyoderma [C17.800.695] Pyoderma
- Rabies [B04.820.455.750.500.700] Rabies virus
- Rabies [C02.782.580.830.750] Rabies
- Refraction disorders [C11.744] Refractive Errors
- Respiratory infections and tuberculosis [C01.252.410.040.552.846] Tuberculosis
- Respiratory infections and tuberculosis [C01.539.739] Respiratory Tract Infections
- Respiratory infections and tuberculosis [C08.730] Respiratory Tract Infections
- Rheumatic heart disease [C01.252.410.890.731.649] Rheumatic Heart Disease
- Rheumatic heart disease [C14.280.874] Rheumatic Heart Disease
- Rheumatoid arthritis [C05.550.114.154] Arthritis, Rheumatoid
- Rheumatoid arthritis [C05.799.114] Arthritis, Rheumatoid
- Rheumatoid arthritis [C17.300.775.099] Arthritis, Rheumatoid
- Rheumatoid arthritis [C20.111.199] Arthritis, Rheumatoid
- Scabies [C03.858.211.480.708] Scabies
- Scabies [C17.800.838.775.800] Scabies
- Schistosomiasis [C03.335.865.859] Schistosomiasis
- Schizophrenia [F03.700.750] Schizophrenia
- Schizophrenia [F04.824] Schizophrenic Psychology
- Sense organ diseases [C10.597.751] Sensation Disorders
- Sense organ diseases [C23.888.592.763] Sensation Disorders
- Sickle cell disorders [C15.378.071.141.150.150] Anemia, Sickle Cell
- Sickle cell disorders [C15.378.420.155] Anemia, Sickle Cell
- Sickle cell disorders [C16.320.070.150] Anemia, Sickle Cell
- Sickle cell disorders [C16.320.365.155] Anemia, Sickle Cell
- Sickle cell trait [C15.378.071.141.150.150.670] Sickle Cell Trait
- Sickle cell trait [C15.378.420.155.668] Sickle Cell Trait
- Sickle cell trait [C16.320.070.150.670] Sickle Cell Trait
- Sickle cell trait [C16.320.365.155.668] Sickle Cell Trait
- Silicosis [C08.381.483.581.760] Silicosis

- Silicosis [C08.381.520.702.760] Silicosis
- Silicosis [C24.800.834] Silicosis
- Skin and subcutaneous diseases [C17.800] Skin Diseases
- Stomach cancer [C04.588.274.476.767] Stomach Neoplasms
- Stomach cancer [C06.301.371.767] Stomach Neoplasms
- Stomach cancer [C06.405.249.767] Stomach Neoplasms
- Stomach cancer [C06.405.748.789] Stomach Neoplasms
- Stroke [C10.228.140.300.775] Stroke
- Stroke [C14.907.253.855] Stroke
- Substance use disorders [C25.775] Substance-Related Disorders
- Substance use disorders [F03.900] Substance-Related Disorders
- Sudden infant death syndrome [C23.550.260.322.625] Sudden Infant Death
- Sudden infant death syndrome [C23.550.260.657.500] Sudden Infant Death
- Syphilis [C01.252.400.840.744] Syphilis
- Syphilis [C01.252.810.859] Syphilis
- Syphilis [C01.252.847.840.744] Syphilis
- Syphilis [C01.539.778.281.859] Syphilis
- Syphilis [C12.294.668.281.859] Syphilis
- Syphilis [C13.351.500.711.281.859] Syphilis
- Tension-type headache [C10.228.140.546.399.875] Tension-Type Headache
- Testicular cancer [C04.588.322.762] Testicular Neoplasms
- Testicular cancer [C04.588.945.440.915] Testicular Neoplasms
- Testicular cancer [C12.294.260.937] Testicular Neoplasms
- Testicular cancer [C12.758.409.937] Testicular Neoplasms
- Testicular cancer [C19.344.762] Testicular Neoplasms
- Testicular cancer [C19.391.829.782] Testicular Neoplasms
- Tetanus [C01.252.410.222.864] Tetanus
- Tetanus [D20.215.894.691.824] Tetanus Toxoid
- Thalassemias [C15.378.071.141.150.875] Thalassemia
- Thalassemias [C15.378.420.826] Thalassemia
- Thalassemias [C16.320.070.875] Thalassemia
- Thalassemias [C16.320.365.826] Thalassemia
- Thalassemias trait [C15.378.071.141.150.875.150] beta-Thalassemia
- Thalassemias trait [C15.378.420.826.150] beta-Thalassemia
- Thalassemias trait [C16.320.070.875.150] beta-Thalassemia
- Thalassemias trait [C16.320.365.826.150] beta-Thalassemia
- Thyroid cancer [C04.588.322.894] Thyroid Neoplasms
- Thyroid cancer [C04.588.443.915] Thyroid Neoplasms
- Thyroid cancer [C19.344.894] Thyroid Neoplasms
- Thyroid cancer [C19.874.788] Thyroid Neoplasms
- Tracheal, bronchus, and lung cancer [C04.588.443.925] Tracheal Neoplasms
- Tracheal, bronchus, and lung cancer [C04.588.894.797.520.109] Bronchial Neoplasms
- Tracheal, bronchus, and lung cancer [C04.588.894.797.520] Lung Neoplasms
- Tracheal, bronchus, and lung cancer [C04.588.894.797.760] Tracheal Neoplasms
- Tracheal, bronchus, and lung cancer [C08.127.265] Bronchial Neoplasms
- Tracheal, bronchus, and lung cancer [C08.381.540] Lung Neoplasms
- Tracheal, bronchus, and lung cancer [C08.785.520.100] Bronchial Neoplasms
- Tracheal, bronchus, and lung cancer [C08.785.520] Lung Neoplasms
- Tracheal, bronchus, and lung cancer [C08.785.760] Tracheal Neoplasms
- Tracheal, bronchus, and lung cancer [C08.907.563] Tracheal Neoplasms
- Trachoma [C01.252.354.225.800] Trachoma
- Trachoma [C01.252.400.210.210.800] Trachoma
- Trachoma [C01.539.375.354.220.800] Trachoma
- Trachoma [C11.187.183.220.889] Trachoma
- Trachoma [C11.204.813] Trachoma
- Trachoma [C11.294.354.220.800] Trachoma
- Trichomoniasis [B01.630.800.808.717] Trichomonas vaginalis
- Trichomoniasis [C03.752.890] Trichomonas Infections
- Trichuriasis [C03.335.508.100.275.895] Trichuriasis
- Tuberculosis [C01.252.410.040.552.846] Tuberculosis
- Turner syndrome [C16.131.240.400.970] Turner Syndrome
- Turner syndrome [C16.131.260.830.835.750] Turner Syndrome
- Turner syndrome [C16.131.939.316.309.872] Turner Syndrome
- Turner syndrome [C16.131.939.316.795.750] Turner Syndrome
- Turner syndrome [C16.320.180.830.835.750] Turner Syndrome
- Typhoid and paratyphoid [C01.252.400.310.821.438] Paratyphoid Fever
- Typhoid and paratyphoid [C01.252.400.310.821.873] Typhoid Fever
- Typhoid fever [C01.252.400.310.821.873] Typhoid Fever
- Upper digestive system diseases [N/A] N/A
- Upper respiratory infections [C01.539.739] Respiratory Tract Infections
- Upper respiratory infections [C08.730] Respiratory Tract Infections
- Urinary diseases and male infertility [C12.294.365.700] Infertility, Male
- Urinary diseases and male infertility [C12.777] Urologic Diseases
- Urinary diseases and male infertility [C13.351.968] Urologic Diseases
- Urinary tract infections [C01.539.895] Urinary Tract Infections
- Urinary tract infections [C12.777.892] Urinary Tract Infections
- Urinary tract infections [C13.351.968.892] Urinary Tract Infections
- Urogenital congenital anomalies [C16.131.939] Urogenital Abnormalities
- Urolithiasis [C12.777.967] Urolithiasis
- Urolithiasis [C13.351.968.967] Urolithiasis
- Urticaria [C17.800.862.945] Urticaria
- Urticaria [C20.543.480.904] Urticaria
- Uterine cancer [C04.588.945.418.948] Uterine Neoplasms
- Uterine cancer [C13.351.500.852.762] Uterine Neoplasms
- Uterine cancer [C13.351.937.418.875] Uterine Neoplasms
- Uterine fibroids [C04.557.450.590.450] Leiomyoma
- Varicella and herpes zoster [B04.280.382.100.900.460] Herpesvirus 3] Human
- Varicella and herpes zoster [C02.256.466.930.250] Chickenpox
- Varicella and herpes zoster [C02.256.466.930.750] Herpes Zoster
- Vascular intestinal disorders [C14.907] Vascular Diseases
- Viral skin diseases [C02.825] Skin Diseases, Viral
- Viral skin diseases [C17.800.838.790] Skin Diseases, Viral
- Visceral leishmaniasis [C03.752.300.500.510] Leishmaniasis, Visceral
- Vitamin A deficiency [C18.654.521.500.133.628] Vitamin A Deficiency
- Whooping cough [C01.252.400.143.740] Whooping Cough
- Whooping cough [C01.539.739.969] Whooping Cough
- Whooping cough [C08.730.969] Whooping Cough
- Yellow fever [B04.820.250.350.990] Yellow fever virus
- Yellow fever [C02.081.980] Yellow Fever
- Yellow fever [C02.782.350.250.980] Yellow Fever
- Yellow fever [C02.782.417.881] Yellow Fever
- Zika virus [B04.820.250.350.995] Zika Virus
- Zika virus [C02.081.990] Zika Virus Infection
- Zika virus [C02.782.350.250.990] Zika Virus Infection

Table S-1: Estimates showing the percentage of patents classified as **female-focused** by the MTI algorithm that are classified as **female-focused** by trained MeSH indexers. 95% Confidence intervals in brackets. Top left shows recall, bottom left the false negative rate, bottom right the precision, and top right the false positive rate.

Female-focused (Indexer)	Female-focused (MTI)	
	False	True
False	65.46 [55.71, 74.06]	6.84 [3.73, 12.21]
True	34.54 [25.94, 44.29]	93.16 [87.79, 96.27]

Table S-2: Estimates showing the percentage of patents classified as **male-focused** by the MTI algorithm that are classified as **male-focused** by trained MeSH indexers. 95% Confidence intervals in brackets. Top left shows recall, bottom left the false negative rate, bottom right the precision, and top right the false positive rate.

Male-focused (Indexer)	Male-focused (MTI)	
	False	True
False	67.43 [57.54, 75.98]	7.52 [4.03, 13.60]
True	32.57 [24.02, 42.46]	92.48 [86.40, 95.97]

Table S-3: Precision and recall for whether a patent is **female-focused**, split by the gender composition of the inventor team. 95% Confidence intervals in brackets. In each table the top left shows recall, bottom left the false negative rate, bottom right the precision, and top right the false positive rate.

(A) Female Majority Team (50% or Greater)		
Female-focused (Indexer)	Female-focused (MTI)	
	False	True
False	65.47 [53.75, 75.56]	3.69 [1.56, 8.49]
True	34.53 [24.44, 46.25]	96.31 [91.51, 98.44]
(B) Male Majority Team (Greater than 50%)		
Female-focused (Indexer)	Female-focused (MTI)	
	False	True
False	65.46 [54.00, 75.37]	7.53 [3.86, 14.17]
True	34.54 [24.63, 46.00]	92.47 [85.83, 96.14]

Table S-4: Precision and recall for whether a patent is **male-focused**, split by the gender composition of the inventor team. 95% Confidence intervals in brackets. In each table the top left shows recall, bottom left the false negative rate, bottom right the precision, and top right the false positive rate.

(A) Female Majority Team (50% or Greater)		
Male (Indexer)	Male (MTI)	
	False	True
False	70.86 [59.01, 80.42]	7.48 [4.10, 13.27]
True	29.14 [19.58, 40.99]	92.52 [86.73, 95.90]

(B) Male Majority Team (Greater than 50%)		
Male (Indexer)	Male (MTI)	
	False	True
False	66.77 [55.11, 76.68]	7.53 [3.63, 14.97]
True	33.23 [23.32, 44.89]	92.47 [85.03, 96.37]

Table S-5: The 100 words most associated with patents tagged with the “Female” check tag.

Z-Score			Z-Score		
Rank	Word	Raw Odds-Ratio (Weighted Z-Score)	Rank	Word	Raw Odds-Ratio (Weighted Z-Score)
1	cows	6843.8 (31)	51	vulvar	176.6 (6)
2	gynecologic	2113 (17)	52	labia	167.6 (10)
3	iud	1911.2 (17)	53	cesarean	165.5 (7)
4	lactating	1870.8 (16)	54	nonoxynol	157.5 (7)
5	hysterectomy	1860.7 (15)	55	uterus	157.1 (38)
6	sows	1803.5 (16)	56	papanicolaou	150 (8)
7	premenopausal	1009.4 (12)	57	guzmania	147.5 (10)
8	granulosa	948.8 (12)	58	hysteroscopy	146.7 (6)
9	mares	942.1 (12)	59	mammogram	145.1 (9)
10	mastitis	923.6 (21)	60	mammographic	141.3 (8)
11	breastpump	847.9 (11)	61	clitoral	139.4 (7)
12	girls	821 (11)	62	cow	136 (19)
13	calving	767.2 (10)	63	interlabial	135.9 (11)
14	oestrone	753.7 (9)	64	ovulation	134.8 (22)
15	mare	747 (10)	65	pregnancies	130.6 (13)
16	childbearing	679.7 (10)	66	endometrial	127.2 (23)
17	breastpumps	551.8 (8)	67	menstruation	124 (15)
18	woman	491.8 (27)	68	dysmenorrhea	123.3 (13)
19	clitoris	474.4 (8)	69	progestogen	111 (9)
20	spermicide	437.4 (7)	70	msd	107.7 (8)
21	vulva	437.4 (9)	71	megestrol	99 (6)
22	udder	427.3 (10)	72	endometrium	98.3 (18)
23	estrus	405.1 (11)	73	pcos	97.1 (6)
24	menopause	402.5 (22)	74	uteri	94.9 (7)
25	luteal	381.3 (8)	75	teats	90.8 (8)
26	women	378.1 (71)	76	menopausal	89 (22)
27	enterocele	376.8 (7)	77	gestagen	88.2 (7)
28	vagina	348 (36)	78	fibroids	87.9 (12)
29	fallopian	305.1 (22)	79	intrauterine	84.6 (18)
30	endocervical	287.7 (8)	80	brassiere	81.3 (7)
31	vaginitis	279.9 (9)	81	uterine	79.3 (38)
32	spermicidal	276.7 (12)	82	cin	78.8 (10)
33	spermicides	275.9 (7)	83	oviduct	78.7 (8)
34	postpartum	271.4 (10)	84	intravaginal	77.9 (13)
35	rectocele	262.4 (7)	85	pregnancy	77.7 (35)
36	iuds	261.1 (9)	86	antiestrogen	77.6 (8)
37	menorrhagia	259.6 (10)	87	lumpectomy	76 (6)
38	vaginal	257.3 (49)	88	hysteroscope	74.9 (8)
39	cystocele	254.4 (9)	89	endometriosis	73.1 (20)
40	pessary	252.4 (9)	90	ivf	72.5 (10)
41	cervix	245.8 (29)	91	birthing	70.7 (6)
42	pregnant	235.4 (23)	92	trimester	67.8 (7)
43	females	235.2 (28)	93	mammograms	66.8 (7)
44	smbg	212 (10)	94	mammography	65 (18)
45	lactation	209.1 (14)	95	preterm	64.7 (14)
46	postmenopausal	207.9 (18)	96	breastfeeding	64.2 (7)
47	vaginitis	198.9 (10)	97	mastectomy	63.7 (11)
48	hens	197.4 (8)	98	hypermobility	63.2 (9)
49	amniocentesis	187.5 (9)	99	transvaginal	62.5 (7)
50	sow	183.4 (7)	100	progestin	62.3 (13)

Table S-6: The 100 words most associated with patents tagged with the “Male” check tag.

Z-Score Rank	Word	Raw Odds-Ratio (Weighted Z-Score)	Z-Score Rank	Word	Raw Odds-Ratio (Weighted Z-Score)
1	prostatectomy	3636.5 (23)	51	klk	72.2 (6)
2	cavernosa	2008.1 (17)	52	urethral	67.7 (30)
3	cavernosum	926.8 (11)	53	resectoscope	62.2 (13)
4	vasectomy	914 (12)	54	sperm	57.8 (31)
5	retropubic	746.6 (11)	55	sexes	49.8 (9)
6	peyronie	740.2 (10)	56	testis	48.6 (13)
7	erections	727.3 (10)	57	pellucida	46.7 (8)
8	penis	556.2 (39)	58	sui	46.2 (13)
9	scrotum	512.3 (12)	59	androgenetic	45.7 (7)
10	erection	506.4 (26)	60	tumescence	41.3 (6)
11	isd	407.6 (9)	61	phosphenes	39.6 (9)
12	impotence	406.7 (26)	62	nocturia	37.3 (9)
13	circumcision	351.9 (8)	63	orgasm	36.8 (8)
14	spermatozoa	346.9 (15)	64	androgen	33.1 (30)
15	ejaculation	335.3 (14)	65	testicles	32.5 (6)
16	penile	330.7 (30)	66	testosterone	32.2 (26)
17	bull	286.6 (24)	67	testicular	32.2 (12)
18	erectile	273.8 (28)	68	vellus	32 (7)
19	boys	253.2 (7)	69	baldness	30.5 (14)
20	hyperandrogenic	242.4 (7)	70	psa	28.7 (20)
21	ejaculate	238.1 (7)	71	condom	28.5 (23)
22	prostatitis	233.2 (13)	72	continence	28 (11)
23	prostatectomies	227.4 (6)	73	vas	28 (11)
24	bph	209.4 (25)	74	areata	27 (6)
25	glans	199.5 (10)	75	levosimendan	26.1 (6)
26	turp	171.6 (8)	76	coitus	25.2 (7)
27	males	170.8 (30)	77	antiandrogen	24.8 (6)
28	zp	161.7 (9)	78	semen	24.7 (15)
29	prostate	145.7 (71)	79	osas	24.1 (6)
30	deferens	131.7 (10)	80	flutamide	23.7 (6)
31	periurethral	126.8 (9)	81	homosexual	23.2 (6)
32	castration	122.6 (11)	82	androgens	22.8 (19)
33	spermatic	111.6 (6)	83	hirsutism	22.2 (9)
34	intraurethral	107.6 (7)	84	male	22.1 (52)
35	dihydrotestosterone	105.6 (12)	85	lhrh	21.7 (15)
36	hypermobility	102.2 (10)	86	antiandrogens	21.7 (8)
37	transurethral	100.7 (13)	87	laughing	21.3 (8)
38	scrotal	97.5 (6)	88	ram	21 (9)
39	dht	96.4 (14)	89	clitoris	20.6 (6)
40	corpora	95.7 (12)	90	intercourse	20.6 (15)
41	sildenafil	83.1 (8)	91	insemination	20 (13)
42	transrectal	83 (7)	92	guzmania	19.6 (8)
43	urethra	81.8 (43)	93	testes	19.6 (11)
44	spermatogenesis	79.1 (11)	94	dbh	19.5 (5)
45	impotency	78.8 (8)	95	zona	19.2 (8)
46	finasteride	75.1 (6)	96	androgenic	18.9 (14)
47	foreskin	74.8 (7)	97	detrusor	18.5 (10)
48	psma	74.5 (8)	98	infertile	18.3 (6)
49	resectoscopes	74.4 (6)	99	voiding	18.2 (9)
50	prostatic	73.6 (34)	100	gender	18.1 (10)

Table S-7: Percentage of patents classified by the authors as focusing on the needs of women and men, by MeSH sex tag

	Human Review			
	Not Sex Focused	Male Focused	Female Focused	Male & Female Focused
No Sex Tags	89	6	5	0
Male Check Tag	38	57	4	2
Female Check Tag	28	6	62	2
Male & Female Check Tag	35	26	23	16

Table S-8: Patents tagged as female by the MTI address diseases with higher female incidence counts; male-tagged patents address diseases with higher male incidence

Dependent Variables: Model:	Log Female Incidence (1)	Log Female Incidence (2)	Log Male Incidence (3)	Log Male Incidence (4)
<i>Variables</i>				
Female MeSH	1.1*** (0.02)	1.3*** (0.02)		-1.3*** (0.02)
Male MeSH		-0.69*** (0.01)	0.37*** (0.01)	0.73*** (0.01)
Log Male Incidence	0.93*** (0.001)	0.93*** (0.001)		
Log Female Incidence			0.96*** (0.0005)	0.96*** (0.0005)
(Intercept)	0.95*** (0.01)	1*** (0.01)	0.15*** (0.006)	0.27*** (0.006)
<i>Fit statistics</i>				
Observations	662,727	662,727	662,727	662,727
R ²	0.87311	0.87479	0.86924	0.87533

Each observation is a patent-disease match.

Patents are inverse-weighted by the number of diseases each patent matches.

Standard-errors, clustered by patent, in parentheses.

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-9: List of patents with our female-only trial prediction measure

P(Female Trial)	P(Male Trial)	Patent title	Female Focused?
100%	1%	<i>Treatment of climacteric disorders with nitric oxide synthase substrates and/or donors</i>	Y
99%	0%	<i>Transdermal hormone replacement therapy</i>	Y
99%	2%	<i>Use of estradiol valerate or 17β-estradiol in combination with ... increase feminine libido</i>	Y
98%	0%	<i>Benzothiophene compounds, compositions, and methods</i>	Y
95%	3%	<i>Connection mechanisms for uterine mobilizer</i>	Y
90%	0%	<i>Detection of group B Streptococcus</i>	Y
88%	2%	<i>Prostaglandine derivatives</i>	
88%	0%	<i>Nursing apparatus</i>	Y
85%	5%	<i>Treatment of cellulite and adipose tissue with mid-infrared radiation</i>	Y
85%	1%	<i>Catheter for measuring intrauterine pressure</i>	Y
79%	0%	<i>Urinary incontinence device</i>	
77%	5%	<i>Sanitary feminine napkin with a mechanism for optional contouring</i>	Y
74%	7%	<i>Method for increasing placental blood flow</i>	Y
74%	0%	<i>Indenone derivative and pharmaceutical composition comprising same</i>	Y
73%	0%	<i>Apparatus for expressing milk</i>	Y
67%	4%	<i>Method for isolating a novel receptor for α.4 integrins</i>	
63%	6%	<i>Absorbent article having tucked flaps</i>	Y
63%	0%	<i>Ultrasound device for use in a thermotherapy apparatus</i>	Y
62%	0%	<i>Liquid handling member with inner materials having good creep...</i>	
61%	2%	<i>Tetrahydrocarbazole derivatives and their pharmaceutical use</i>	Y
58%	0%	<i>Breathing circuit connector for use in anesthesiology</i>	
55%	3%	<i>Methods of using growth inhibitory peptides</i>	
55%	1%	<i>Absorbent products having integral transverse retaining tab and pocket</i>	Y
54%	3%	<i>Breastpump with stimulation and method</i>	Y
53%	0%	<i>Anti-midkine antibody for preventing post-laparotomy adhesions</i>	
50%	4%	<i>Angiostatin fragments and method of use</i>	
49%	17%	<i>Apparatus and method for displaying three-dimensional image and ultrasonic ...</i>	
46%	31%	<i>Method for preparation of androst-4-ene-3,17-dione and androsta-1,4-diene-3,17-dione</i>	
44%	1%	<i>Static devices and methods to shrink tissues for incontinence</i>	Y
41%	7%	<i>Pharmaceutically active compounds and methods of use</i>	
40%	2%	<i>Apparatus and process for monitoring a pregnant mammal</i>	
38%	0%	<i>Tissue expander stent</i>	Y
35%	2%	<i>Equal phase two-dimensional array probe</i>	
33%	14%	<i>Method and portable device for treating skin disorders</i>	
33%	3%	<i>Device for the height-adjustable fixing and support of internal anatomical organs</i>	
29%	7%	<i>Treatment of cardiac dysfunction with 15-ketoprostaglandin compounds</i>	
24%	5%	<i>Liquid absorbing material and method for making the same</i>	Y
23%	0%	<i>Soybean cultivar 9380279522807</i>	
23%	6%	<i>Cosmetic agent on the basis of quaternary chitosan derivatives, novel quaternary...</i>	
21%	3%	<i>Power transmission apparatus for electric bending endoscope</i>	
16%	0%	<i>Culture flask</i>	
12%	1%	<i>Method for enhancing functional properties of submucosal tissue graft constructs</i>	
12%	7%	<i>Method and apparatus for visualization of motion in ultrasound flow imaging ...</i>	
11%	32%	<i>Method for producing an L-amino acid using a bacterium of the Enterobacteriaceae ...</i>	
11%	5%	<i>Delivery of nucleic acid to cells</i>	
3%	6%	<i>Glass-like polysaccharide useful as absorbent for liquids</i>	
2%	18%	<i>Controlled-release formulations, method of manufacture, and use thereof</i>	
2%	2%	<i>Therapeutic catheter with displacement sensing transducer</i>	
1%	0%	<i>Versatile operator light system</i>	
0%	0%	<i>Defibrillation apparatus and method</i>	

Table S-10: List of patents with our male-only trial prediction measure

P(Female Trial)	P(Male Trial)	Patent title	Male Focused?
0%	100%	Certain phosphonomethyl-pentanedioic acid derivatives thereof	Y
2%	99%	Method for treatment of alopecia	Y
1%	99%	Implantable penile prosthetic cylinder with inclusive fluid reservoir	Y
0%	98%	Alpha interferon for treating prostate cancer	Y
2%	95%	Benzimidazole derivatives useful as selective androgen receptor modulators (sarms)	Y
49%	85%	17- α -hydroxysteroid dehydrogenase type 3 inhibitors for the treatment of androgen...	Y
0%	85%	Azolyl substituted aralkyl compounds and pesticidal use thereof	
2%	84%	Purified luciferase from luciola lateralis	
5%	82%	Cosmetic or pharmaceutical composition for topical use to prevent ...androgenetic alopecia	Y
1%	82%	Implantable penile prosthesis	Y
0%	79%	Herbal compositions for prostate conditions	Y
2%	78%	Benzonaphthyridines	
0%	75%	Method of determining the presence of endotoxin in a sample	
0%	72%	N-phenoxypropanol-N'-pyridazinyl ethylenediamines as .beta.-receptor blockers	Y
4%	72%	Condensed polycyclic compounds	Y
1%	70%	1(p-Chlorobenzoyl)-5-methoxy-2-methyl indole-3-acetic acid-3-oxo-isobenzofuranyl...	
3%	64%	Stable colored reference standard for enzymatic determinations	
0%	64%	Treatment and diagnosis of cancer	Y
0%	63%	Anti-hypertensive polyhaloisopropyl-substituted arylureas	Y
0%	63%	3-alkoxy-1-phenylpyrazole derivatives and pesticides	
16%	60%	Photostable cosmetic light screening compositions	
1%	59%	Methods of using soluble epoxide hydrolase inhibitors	
5%	57%	Methods of using 2,4-dienoic acid esters of tocopherols to reduce free radical damage...	
1%	52%	Method of treating helminthiasis by parenteral administration of sulfide- and ...	Y
1%	52%	Analogues of the active metabolite of leflunomide	
0%	49%	Hair conditioner compositions having improved freezing and freeze-thaw stability	
0%	47%	Novel compounds	
1%	47%	Composition and method to modify sperm function and increase male gender ratio ...	Y
2%	45%	Novel HMG-CoA reductase inhibitors	Y
0%	41%	3-Substituted-5-alkyl-1,6-naphthyridin-2(1H)-ones, cardiotonic use and preparation...	
2%	38%	Microbiological process for oxidation of methyl groups	
5%	38%	Lactamimides as calcium antagonists	
26%	34%	Osmotic drug delivery monitoring system and method	
1%	33%	Glucose dehydrogenase and its production	
3%	31%	Method for the oxidation of aromatic compounds	
3%	27%	Method for detection of long-lived radioisotopes in small biochemical samples	
4%	27%	Benzocycloheptapyrans, compositions, and method of treatment	
3%	25%	Benzoindoline compounds	
1%	25%	Family GH 61 polypeptides	
1%	22%	Pyridopyrimidinone antianginal agents	
3%	20%	Water-degradable fishing lure	
3%	19%	Quinoline derivatives 057	
7%	15%	Flavonoid complexes with cyclodextrins	
0%	12%	Triazine derivatives, and pharmaceutical compositions comprising the same	
9%	11%	Ultrasonic diagnostic apparatus capable of performing switching between single beam ...	
21%	5%	Method of producing products for use in the treatment of bacterial and/or virus infections	
0%	5%	Quinoxalinones as antibacterial composition	
5%	4%	Multi-chamber vial	
5%	2%	Method and device for applying external pressure in combination with ...	
1%	0%	Recessed tip fluid dispenser	

Table S-11: Patents tagged as female by the MTI are more likely to describe inventions that would require a female-only clinical trial; patents tagged as male are more likely to require a male-only clinical trial

Dependent Variables: Model:	P(Female Trial) (1)	P(Female Trial) (2)	P(Female Trial) > 80% (3)	P(Male Trial) (4)	P(Male Trial) (5)	P(Male Trial) > 80% (6)
<i>Variables</i>						
Female MeSH	13.1*** (0.13)	14.2*** (0.13)	9.9*** (0.13)		-4.7*** (0.06)	-1.1*** (0.05)
Male MeSH		-3.6*** (0.07)	-2*** (0.07)	3.7*** (0.09)	5.1*** (0.10)	4.7*** (0.09)
(Intercept)	4*** (0.009)	4.3*** (0.01)	0.21*** (0.007)	7*** (0.02)	7.4*** (0.02)	0.23*** (0.008)
Observations	430,001	430,001	430,001	430,001	430,001	430,001
R ²	0.12337	0.13224	0.08423	0.00985	0.02368	0.03351

Robust standard-errors in parentheses.

*Signif. Codes: ***, 0.001, **, 0.01, *, 0.05*

Table S-12: Gender-identification success rates, by team size and geographic location

Inventor count	Non-US teams	US teams
1	0.800	0.908
2	0.690	0.819
3	0.605	0.744
4	0.539	0.677
5	0.491	0.615
6	0.460	0.559
7	0.426	0.495
8	0.371	0.468
9	0.324	0.467
10	0.279	0.398
> 10	0.308	0.387

Table S-13: Patent regressions corresponding to Figure 4A

Dependent Variable:		Female Patent						
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Minority Female	1.3*** (0.16)	0.96* (0.41)	1.1*** (0.27)	1.5*** (0.23)	1.2*** (0.18)	2.7*** (0.43)	1*** (0.18)	1.9*** (0.41)
Majority Female	2.4*** (0.19)	2.6*** (0.54)	1.5*** (0.31)	2.9*** (0.26)	1.9*** (0.21)	5.8*** (0.53)	2.1*** (0.21)	2.6*** (0.40)
All Female	4.6*** (0.30)	6.4*** (0.84)	3.7*** (0.51)	4.7*** (0.42)	2.3*** (0.36)	8.7*** (0.63)	3.4*** (0.36)	5.8*** (0.54)
<i>Fixed-effects</i>								
Year $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year $\times$ Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	430,060	70,395	145,704	213,961	237,550	148,397	319,104	110,956
R ²	0.01617	0.02814	0.01408	0.0119	0.01137	0.00649	0.01658	0.01811

Robust standard-errors in parentheses

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-14: Matched patent regressions corresponding to Figure 4A (minority-Female Teams)

Dependent Variable: Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Minority Female	0.39 (0.37)	1.9 (1.3)	1.1 (0.63)	1.2 (0.61)	0.71 (0.42)	-0.19 (0.87)	0.20 (0.41)	-2.1 (1.3)
<i>Fixed-effects</i>								
Year $\times$ Team Size $\times$ Disease $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>								
Year $\times$ Team Size $\times$ Disease $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	38,090	1,819	11,574	11,361	26,293	10,314	29,269	3,094
R ²	0.28733	0.35065	0.31419	0.32062	0.30299	0.24761	0.2919	0.38558

Robust standard-errors in parentheses, matching weighted

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-15: Matched patent regressions corresponding to Figure 4A (majority-female teams)

Dependent Variable: Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Majority Female	1.3*** (0.38)	3.2* (1.4)	1.3* (0.64)	1.1* (0.49)	1.3** (0.43)	1.8* (0.89)	1.3** (0.44)	2.4* (1)
<i>Fixed-effects</i>								
Year×Team Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>								
Year×Team Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	45,440	2,878	15,141	27,421	29,948	13,009	31,133	5,866
R ²	0.25702	0.24635	0.26051	0.2541	0.29111	0.18743	0.26617	0.32377

Robust standard-errors in parentheses, matching weighted

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-16: Matched patent regressions corresponding to Figure 4A (all-female teams)

Dependent Variable:		Female Patent							
Model:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>									
All Female		2.8*** (0.55)	5.8*** (1.6)	0.93 (0.95)	3.3*** (0.75)	1.8** (0.70)	4.4*** (1)	1.4* (0.70)	3.8*** (1.1)
<i>Fixed-effects</i>									
Year×Team	Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>									
Year×Team	Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>									
Restriction		1976–1989		1990–1999	2000–2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>									
Observations		36,249	3,704	12,548	19,997	17,141	15,158	19,237	7,894
R ²		0.21029	0.20647	0.20794	0.21241	0.26324	0.15257	0.23769	0.22662

Robust standard-errors in parentheses, matching weighted

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-17: Do female inventors invent for men?

Dependent Variable: Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Minority Female	0.38* (0.17)	-0.62 (0.44)	0.12 (0.28)	0.75** (0.23)	0.35 (0.18)	0.99* (0.42)	0.26 (0.18)	0.38 (0.40)
Majority Female	-0.03 (0.18)	-0.72 (0.53)	-0.46 (0.30)	0.38 (0.25)	0.26 (0.20)	-0.35 (0.48)	-0.33 (0.20)	0.14 (0.39)
All Female	0.60* (0.28)	0.77 (0.79)	-0.38 (0.48)	1.2** (0.39)	0.06 (0.34)	1.3* (0.58)	0.25 (0.34)	0.45 (0.50)
<i>Fixed-effects</i>								
Year × Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year × Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	430,060	70,395	145,704	213,961	237,550	148,397	319,104	110,956
R ²	0.01451	0.02034	0.01374	0.01269	0.00659	0.00417	0.01462	0.01859

Robust standard-errors in parentheses

Signif. Codes: ***: 0.001, **: 0.01, *: 0.05

Table S-18: Do female inventors invent for men? Exact matching results (minority-female teams)

Dependent Variable: Model:	Male Patent							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Minority Female	0.50 (0.37)	-2 (1.4)	0.28 (0.64)	0.29 (0.64)	1.2** (0.42)	-1.8* (0.89)	0.71 (0.43)	-2.1 (1.2)
<i>Fixed-effects</i>								
Year $\times$ Team Size $\times$ Disease $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>								
Year $\times$ Team Size $\times$ Disease $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	38,090	1,819	11,574	11,361	26,293	10,314	29,269	3,094
R ²	0.31865	0.32573	0.34717	0.3368	0.33672	0.2696	0.32448	0.43274

Robust standard-errors in parentheses, matching weighted

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-19: Do female inventors invent for men? Exact matching results (majority-female teams)

Dependent Variable: Model:	Male Patent							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Majority Female	-0.63 (0.38)	-2.9* (1.4)	-0.90 (0.64)	-0.25 (0.49)	0.25 (0.44)	-3.5*** (0.87)	-0.29 (0.45)	-1.2 (0.98)
<i>Fixed-effects</i>								
Year×Team Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>								
Year×Team Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	45,440	2,878	15,141	27,421	29,948	13,009	31,133	5,866
R ²	0.28146	0.23387	0.28731	0.28132	0.31685	0.21206	0.28507	0.40049

Robust standard-errors in parentheses, matching weighted

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-20: Do female inventors invent for men? Exact matching results (all-female teams)

Dependent Variable: Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
All Female	-1.1* (0.54)	-1.2 (1.6)	-1.9* (0.92)	-0.57 (0.74)	-0.90 (0.71)	-1.7 (0.96)	-1.2 (0.69)	0.38 (1)
<i>Fixed-effects</i>								
Year×Team Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>								
Year×Team Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Sample Restrictions</i>								
Restriction	1976-1989		1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fit statistics</i>								
Observations	36,249	3,704	12,548	19,997	17,141	15,158	19,237	7,894
R ²	0.23966	0.21891	0.24325	0.24111	0.28316	0.19432	0.24818	0.29613

Robust standard-errors in parentheses, matching weighted

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-21: Patent regressions hold when using logistic regression or focusing on female-only patents

Dependent Variables:		Female Patent				Female Patent Only			
		OLS		Logit		OLS		Logit	
Family Model:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>									
Minority Female		1.3*** (0.16)	0.71* (0.28)	0.12*** (0.02)	0.06* (0.03)	0.94*** (0.13)	0.71** (0.23)	0.14*** (0.02)	0.10*** (0.03)
Majority Female		2.4*** (0.19)	1.3*** (0.32)	0.22*** (0.02)	0.11*** (0.03)	2*** (0.16)	1*** (0.26)	0.28*** (0.02)	0.14*** (0.03)
All Female		4.6*** (0.30)	3.2*** (0.48)	0.36*** (0.02)	0.26*** (0.04)	3.5*** (0.25)	2.9*** (0.39)	0.42*** (0.03)	0.35*** (0.04)
<i>Fixed-effects</i>									
Year×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Area		Yes			Yes		Yes		Yes
Observations		430,060	207,648	428,588	163,263	430,060	207,648	427,867	142,867

Robust standard-errors in parentheses

Signif. Codes: ***: 0.001, **: 0.01, *: 0.05

Table S-22: Patent regressions hold when we feed more or less patent text to the MTI algorithm

Dependent Variable:			Female Patent					
Model:	2,500 Characters		Title and Abstract		Strict Filtering		10,000 Characters	
<i>Variables</i>								
Minority Female	1.3*** (0.16)	0.71* (0.28)	1.2*** (0.15)	1.00*** (0.28)	0.67*** (0.13)	0.38 (0.21)	1.6*** (0.19)	0.81* (0.35)
Majority Female	2.4*** (0.19)	1.3*** (0.32)	2.1*** (0.17)	1.5*** (0.31)	1.5*** (0.15)	0.62** (0.24)	2.7*** (0.21)	1.5*** (0.38)
All Female	4.6*** (0.30)	3.2*** (0.48)	3.8*** (0.28)	3.1*** (0.47)	3.1*** (0.25)	2.4*** (0.38)	5.1*** (0.33)	4.3*** (0.56)
<i>Fixed-effects</i>								
Year×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Area		Yes		Yes		Yes		Yes
<i>Fit statistics</i>								
Observations	430,060	207,648	430,117	203,284	430,107	211,366	430,102	203,285
R ²	0.01617	0.2878	0.01405	0.27091	0.01049	0.30259	0.01575	0.26548
<i>Robust standard-errors in parentheses</i>								
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>								

Table S-23: Patent regressions hold when we restrict our sample to patents tagged as focusing on “humans” or by excluding patents tagged as focusing on “animals”

Dependent Variable: Model:	(1)	(2)	Female Patent	
			(3)	(4)
<i>Variables</i>				
Minority Female	1.5*** (0.23)	0.69* (0.34)	1.3*** (0.19)	0.77* (0.34)
Majority Female	2.9*** (0.26)	1.5*** (0.38)	2.6*** (0.22)	1.1** (0.39)
All Female	5.3*** (0.39)	3.4*** (0.57)	5.1*** (0.35)	3.4*** (0.56)
<i>MeSH Sample</i>	“Humans”	“Humans”	Not “Animals”	Not “Animals”
<i>Fixed-effects</i>				
Year×Subcategory	Yes	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes	Yes
Year×Disease Area		Yes		Yes
<i>Fit statistics</i>				
Observations	303,962	169,610	336,150	158,542
R ²	0.00695	0.29313	0.02006	0.29734

Robust standard-errors in parentheses

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-24: Women are more likely to invent for women when using alternative measures of patent's sex focus

Dependent Variables: Model:	Log Female Incidence (1)	P(Female Trial) (2)	P(Female Trial) >80% (3)	Log Male Incidence (4)	P(Male Trial) (5)	P(Male Trial)% >80% (6)
<i>Variables</i>						
Minority Female	0.04** (0.01)	0.61*** (0.06)	0.33*** (0.05)	-0.03* (0.01)	-0.15* (0.07)	0.01 (0.04)
Majority Female	0.07*** (0.02)	1.4*** (0.08)	0.79*** (0.07)	-0.07*** (0.02)	-0.24*** (0.07)	-0.04 (0.05)
All Female	0.16*** (0.02)	2.8*** (0.14)	1.6*** (0.13)	-0.12*** (0.02)	-0.22* (0.09)	-0.11 (0.07)
Log Male Incidence	0.93*** (0.001)					
Log Female Incidence				0.96*** (0.0005)		
<i>Fixed-effects</i>						
Year×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	662,727	430,001	430,001	662,727	430,001	430,001
R ²	0.86896	0.0186	0.00483	0.86905	0.11081	0.00309

Robust standard-errors in parentheses in columns 2, 3, 5, & 6.

In 1 and 4 each observation is a patent-disease match.

In 1 and 4 inverse weighting by the number of diseases each patent matches.

In 1 and 4 standard-errors clustered at the patent level in parentheses.

*Signif. Codes: ***, 0.001, **, 0.01, *, 0.05*

Table S-25: The findings presented in Figure 4A, Figure S-5, and Table S-13 replicate when we use the estimated female-only trial probability in place of the female check tag

Dependent Variable:		P(Female Trial)						
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>								
Minority Female	0.61*** (0.06)	0.57*** (0.16)	0.64*** (0.11)	0.60*** (0.08)	0.34*** (0.07)	1.6*** (0.18)	0.71*** (0.14)	0.57*** (0.07)
Majority Female	1.4*** (0.08)	1.7*** (0.24)	0.97*** (0.13)	1.6*** (0.11)	0.65*** (0.08)	4.9*** (0.26)	1.2*** (0.16)	1.4*** (0.09)
All Female	2.8*** (0.14)	3.5*** (0.40)	2.8*** (0.24)	2.7*** (0.19)	1.6*** (0.16)	5.9*** (0.33)	3.8*** (0.26)	2.2*** (0.16)
Sample Restriction		1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fixed-effects</i>								
Year $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year $\times$ Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>								
Observations	430,001	70,360	145,697	213,944	237,507	148,385	110,938	319,063
R ²	0.0186	0.03156	0.01475	0.01676	0.00943	0.01466	0.02056	0.02021
<i>Robust standard-errors in parentheses</i>								
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>								

Table S-26: The findings presented in Figure 4A, Figure S-5, and Table S-14 replicate when we use the estimated female-only trial probability in place of the female check tag

Dependent Variable: Model:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>									
Minority Female		0.12 (0.10)	-0.15 (0.41)	0.46* (0.19)	0.44* (0.19)	0.05 (0.11)	0.33 (0.27)	0.22 (0.31)	0.17 (0.12)
Sample Restriction			1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fixed-effects</i>									
Year $\times$ Team Size $\times$ Disease $\times$ Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>									
Observations		38,089	1,819	11,574	11,361	26,293	10,313	3,094	29,268
R ²		0.52193	0.48665	0.53052	0.5349	0.48847	0.56365	0.53764	0.53545

Robust standard-errors in parentheses
*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-27: The findings presented in Figure 4A, Figure S-5, and Table S-15 replicate when we use the estimated female-only trial probability in place of the female check tag

Dependent Variable:		P(Female Trial)							
Model:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>									
Majority Female		0.51*** (0.12)	2*** (0.51)	0.25 (0.20)	0.50** (0.16)	0.18 (0.13)	1.6*** (0.34)	0.63* (0.30)	0.52*** (0.15)
Sample Restriction			1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fixed-effects</i>									
Year×Team	Size×Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>									
Observations		45,434	2,872	15,141	27,421	29,942	13,009	5,866	31,133
R ²		0.4897	0.39762	0.46734	0.51134	0.46969	0.50872	0.52503	0.49578

Robust standard-errors in parentheses
*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-28: The findings presented in Figure 4A, Figure S-5, and Table S-16 replicate when we use the estimated female-only trial probability in place of the female check tag

Dependent Variable: Model:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Variables</i>									
All Female		1.6*** (0.21)	1.5* (0.63)	1.4*** (0.35)	1.8*** (0.28)	1.5*** (0.24)	2.2*** (0.43)	1.3*** (0.25)	2.2*** (0.43)
Sample Restriction			1976-1989	1990-1999	2000-2010	Drugs	Surgery	Corporate	Non-Corporate
<i>Fixed-effects</i>									
Year $\times$ Team Size $\times$ Disease $\times$ Subcategory		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>									
Observations		36,246	3,703	12,548	19,995	17,139	15,157	19,235	7,894
R ²		0.42386	0.31741	0.42945	0.44086	0.45562	0.39795	0.47501	0.34818

Robust standard-errors in parentheses
Signif. Codes: ***: 0.001, **: 0.01, *: 0.05

Table S-29: The findings hold when we match on Disease-Subcategory and Year-Disease-Subcategory

Dependent Variable: Model:	(1)	(2)	Female Patent		(5)	(6)
			(3)	(4)		
<i>Variables</i>						
Minority Female	1.3*** (0.28)	1.1*** (0.31)				
Majority Female			1.4*** (0.30)	1.4*** (0.33)		
All Female					2.5*** (0.45)	2.6*** (0.50)
<i>Fixed-effects</i>						
Disease×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease×Subcategory		Yes		Yes		Yes
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>						
Disease×Subcategory	Yes		Yes		Yes	
Year×Disease×Subcategory		Yes		Yes		Yes
<i>Fit statistics</i>						
Observations	170,853	121,495	157,009	100,896	140,208	71,180
R ²	0.15909	0.20243	0.16027	0.19412	0.15213	0.18252
<i>Robust standard-errors in parentheses</i>						
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>						

Table S-30: Patent regressions showing our findings hold when we include more or fewer disease fixed effects

Dependent Variable:		Female Patent								
Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Variables</i>										
Minority Female	0.71* (0.28)	0.93** (0.30)	0.82* (0.33)	0.72* (0.35)	0.67 (0.37)	0.73 (0.39)	0.71 (0.40)	0.74 (0.41)	0.74 (0.41)	0.74 (0.41)
Majority Female	1.3*** (0.32)	1.4*** (0.34)	1.4*** (0.37)	1.4*** (0.39)	1.5*** (0.42)	1.6*** (0.44)	1.6*** (0.45)	1.6*** (0.46)	1.6*** (0.46)	1.6*** (0.47)
All Female	3.2*** (0.48)	3.3*** (0.52)	3.5*** (0.56)	3.6*** (0.61)	3.5*** (0.65)	3.4*** (0.67)	3.4*** (0.69)	3.4*** (0.70)	3.4*** (0.71)	3.4*** (0.72)
<i>Fixed-effects</i>										
Year×Subcategory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 2		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 3			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 4				Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 5					Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 6						Yes	Yes	Yes	Yes	Yes
Year×Disease Mesh 7							Yes	Yes	Yes	Yes
Year×Disease Mesh 8								Yes	Yes	Yes
Year×Disease Mesh 9									Yes	Yes
Year×Disease Mesh 10										Yes
<i>Fit statistics</i>										
Observations	207,648	207,648	207,648	207,648	207,648	207,648	207,648	207,648	207,648	207,648
R ²	0.2878	0.41407	0.48919	0.53299	0.55615	0.56725	0.5715	0.57221	0.57236	0.57236

Robust standard-errors in parentheses

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-31: Patent regressions with double selection lasso show similar results

Dependent Variable: Model:	(1)	Female Patent	
		(2)	(3)
<i>Variables</i>			
Minority Female	1.9*** (0.35)	0.97*** (0.21)	0.65*** (0.17)
Majority Female	2.3*** (0.49)	1.1*** (0.27)	1.7*** (0.22)
All Female	5.5*** (0.80)	2.5*** (0.46)	3.5*** (0.37)
<i>Fixed Effects</i>			
Year×Team Size	Yes	Yes	Yes
Year×Subcategory	Yes	Yes	Yes
<i>Sample Restrictions</i>			
Restriction	1976-1989	1990-1999	2000-2010
Observations	70,395	145,704	213,961
<i>Robust standard-errors in parentheses</i>			
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>			

Table S-32: Publication regressions corresponding to Figure 4B

Dependent Variable: Model:	(1)	Female Research		
		(2)	(3)	(4)
<i>Variables</i>				
Minority Female	0.84*** (0.08)	0.74*** (0.17)		
Majority Female	3*** (0.08)		2.4*** (0.19)	
All Female	4.5*** (0.12)			4.1*** (0.32)
<i>Fixed-effects</i>				
Year×Team Size	Yes	Yes	Yes	Yes
Year×Journal	Yes	Yes	Yes	Yes
Year×Team Size×Disease		Yes	Yes	Yes
<i>Exact Matching</i>				
Year×Team Size×Disease		Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	2,062,695	372,222	291,986	119,650
R ²	0.3632	0.39536	0.42926	0.48682
<i>Robust standard-errors in parentheses. Columns 2-4 matching weighted</i>				
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>				

Table S-33: The 100 words most associated with publications tagged with the “Female” check tag

Z-Score		Raw Odds-Ratio	Z-Score		Raw Odds-Ratio
Rank	Word	(Weighted Z-Score)	Rank	Word	(Weighted Z-Score)
1	cin3	1283.4 (23)	51	postmenopausal	49.1 (41)
2	preantral	437.6 (13)	52	placentas	48.1 (14)
3	parametrial	381.5 (12)	53	cesarean	47.9 (16)
4	colposcopy	362.3 (11)	54	granulosa	46 (21)
5	rrso	339.4 (12)	55	mastectomy	45.7 (26)
6	conization	329.6 (12)	56	ovariectomized	45.5 (22)
7	anovulation	328.2 (11)	57	females	45.4 (69)
8	pprom	324 (11)	58	trimester	44.6 (26)
9	hysteroscopy	288.9 (11)	59	alnd	43.8 (13)
10	preeclamptic	270.7 (11)	60	estrus	43.7 (13)
11	z0011	259.5 (10)	61	postpartum	40.6 (25)
12	leep	251.1 (10)	62	eoc	39.9 (20)
13	cin2	239.8 (13)	63	dcis	39.7 (24)
14	myometrial	234.1 (14)	64	gdm	38.3 (19)
15	nulliparous	216.8 (11)	65	ovariectomy	38.3 (15)
16	figo	215.2 (15)	66	genders	38.2 (15)
17	pcos	192.9 (29)	67	catastrophizing	38 (10)
18	endometrioid	171.2 (16)	68	menopausal	37.5 (24)
19	endometriosis	136.7 (24)	69	women's	37.4 (20)
20	woman	132.1 (43)	70	menopause	35.1 (22)
21	hysterectomy	128 (21)	71	tubal	34.1 (11)
22	menarche	120.1 (13)	72	vaginal	33.6 (35)
23	preeclampsia	117.4 (24)	73	obstetric	32.7 (13)
24	decidual	106.8 (12)	74	female	31.6 (97)
25	myometrium	100.8 (12)	75	lumpectomy	30.6 (10)
26	pregnancies	99.9 (31)	76	ovarian	28.1 (71)
27	girl	98.4 (18)	77	gender	27.6 (65)
28	fibroids	96.3 (10)	78	ovulation	27.3 (18)
29	vulvar	90.7 (13)	79	nstemi	25.1 (13)
30	women	88.2 (160)	80	sexes	23.3 (24)
31	luteal	87.9 (18)	81	uterus	23.1 (22)
32	transvaginal	87.9 (13)	82	ovaries	22.9 (20)
33	premenopausal	87.8 (24)	83	cytoreduction	22.7 (13)
34	ovx	83.1 (27)	84	ewes	22.3 (13)
35	eclampsia	80.6 (12)	85	lvmi	22.1 (10)
36	endometrial	77.9 (44)	86	antenatal	22.1 (12)
37	girls	76.9 (32)	87	cert	21.6 (10)
38	oophorectomy	69.7 (12)	88	euroscore	21.5 (14)
39	ovulatory	66.2 (11)	89	vagina	21.2 (12)
40	miscarriage	61.9 (12)	90	slnb	21.1 (15)
41	menstrual	61.2 (24)	91	mace	20.8 (24)
42	endometrium	60.8 (21)	92	lactation	20.3 (19)
43	estrous	58.3 (16)	93	savr	20.1 (10)
44	uterine	56.6 (41)	94	nipple	19.7 (16)
45	gynecologic	55.4 (19)	95	mothers	19.5 (31)
46	pregnant	55 (47)	96	mammographic	19.2 (18)
47	pregnancy	54.6 (70)	97	gynecological	19.1 (11)
48	nonpregnant	53.5 (15)	98	hrql	18.9 (12)
49	fallopian	50.2 (12)	99	cervix	18.8 (17)
50	amci	49.4 (11)	100	breasts	18.6 (16)

Table S-34: The 100 words most associated with publications tagged with the “Male” check tag

Z-Score		Raw Odds-Ratio	Z-Score		Raw Odds-Ratio
Rank	Word	(Weighted Z-Score)	Rank	Word	(Weighted Z-Score)
1	iief	1029.2 (21)	51	epididymis	22.3 (12)
2	gleason	979.2 (30)	52	sexes	21.4 (23)
3	hgpin	665.8 (17)	53	vasc	21.3 (11)
4	psadt	503.8 (15)	54	hfref	20.2 (11)
5	extraprostatic	500 (15)	55	ipss	19.7 (14)
6	intraprostatic	457.9 (14)	56	euroscore	19.4 (13)
7	sextant	423.4 (13)	57	mace	19.3 (23)
8	peyronie's	292.1 (11)	58	lncap	19.1 (23)
9	intratesticular	276.8 (11)	59	rankin	19 (17)
10	chordee	251.3 (10)	60	cto	18.4 (16)
11	erspc	250 (10)	61	ahi	18.3 (19)
12	gonocytes	239.8 (10)	62	abiraterone	17.6 (10)
13	mcrpc	202 (10)	63	leydig	17.3 (14)
14	varicocele	192 (12)	64	mmse	17.2 (15)
15	seminiferous	121.5 (13)	65	sperm	17.2 (45)
16	prostates	120.5 (10)	66	octogenarians	16.6 (10)
17	turp	118.7 (11)	67	tavi	16.5 (20)
18	scrotal	116.1 (12)	68	stemi	15.8 (27)
19	prostatectomy	102.6 (33)	69	postexercise	15.6 (11)
20	spermatogonia	98.9 (13)	70	tevar	15.4 (14)
21	prostatitis	97.7 (13)	71	adt	15.3 (16)
22	crpc	83.3 (16)	72	pugh	15.2 (14)
23	penile	80.9 (23)	73	hypopnea	15.1 (14)
24	hypospadias	77.6 (13)	74	ohca	15 (15)
25	spermatozoa	73.5 (22)	75	esophagectomy	14.6 (18)
26	acrosome	69 (12)	76	fvc	14.4 (16)
27	boy	67.7 (19)	77	rehospitalization	14.2 (11)
28	spermatids	65.7 (12)	78	beva	14.2 (23)
29	prostatic	64.3 (31)	79	oswestry	14.2 (13)
30	spermatogonial	61.8 (10)	80	nyha	14 (18)
31	ejaculation	60.9 (11)	81	periprocedural	13.8 (14)
32	boys	57.5 (28)	82	updrs	13.7 (12)
33	castration	48.4 (19)	83	clavien	13.6 (11)
34	spermatocytes	45.5 (12)	84	midterm	13.6 (15)
35	penis	45 (12)	85	ppci	13.5 (11)
36	testicular	44 (32)	86	charlson	13.3 (14)
37	sertoli	43.1 (18)	87	womac	13.2 (11)
38	amci	43.1 (10)	88	cabg	13 (34)
39	erectile	40.2 (23)	89	fev1	13 (19)
40	males	37.7 (66)	90	handgrip	12.9 (10)
41	genders	32.6 (15)	91	wmh	12.8 (11)
42	castrated	32 (11)	92	psma	12.4 (17)
43	lvmi	31.1 (10)	93	cimt	12.2 (14)
44	prostate	29.4 (101)	94	subfoveal	12 (12)
45	male	26.2 (105)	95	holter	12 (13)
46	spermatogenesis	25.1 (19)	96	ewl	11.8 (11)
47	epididymal	24.5 (15)	97	das28	11.8 (13)
48	nstemi	23.2 (12)	98	sua	11.7 (10)
49	testes	22.8 (20)	99	tavr	11.7 (16)
50	gender	22.8 (61)	100	nihss	11.6 (13)

Table S-35: Papers tagged as female address diseases with higher female incidence counts; male tagged papers address diseases with higher male incidence

Dependent Variables: Model:	Log Female Incidence (1)	Log Female Incidence (2)	Log Male Incidence (3)	Log Male Incidence (4)
<i>Variables</i>				
Female MeSH	2*** (0.009)	3.4*** (0.01)		-3.5*** (0.01)
Male MeSH		-3.5*** (0.01)	2.1*** (0.008)	3.5*** (0.01)
Log Male Incidence	0.72*** (0.001)	0.79*** (0.0010)		
Log Female Incidence			0.72*** (0.001)	0.78*** (0.001)
(Intercept)	1.9*** (0.01)	2.2*** (0.01)	1.7*** (0.02)	2.3*** (0.01)
<i>Fit statistics</i>				
Observations	581,831	581,831	581,831	581,831
R ²	0.54488	0.64336	0.54912	0.64785
<i>Robust standard-errors in parentheses</i>				
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>				

Table S-36: List of publications with our female-only-trial prediction measure

P(Female Trial)	P(Male Trial)	Patent title	Female Focused?
100%	0%	<i>Multiparity and the risk of premenopausal breast cancer: different effects across ethnic groups in Singapore.</i>	Y
100%	0%	<i>Screening mammography in older women: a review.</i>	Y
100%	0%	<i>Vaginal mesh extrusion associated with use of Mentor transobuturator sling.</i>	Y
98%	0%	<i>Expression of Toll-like receptors 2, 4 and 6 in the equine chorioallantois.</i>	
97%	0%	<i>Female adolescents' views on a youth-friendly clinic.</i>	Y
90%	0%	<i>Use of Six Sigma Methodology to Reduce Appointment Lead-Time in Obstetrics Outpatient Department.</i>	Y
89%	0%	<i>Denosumab and teriparatide transitions in postmenopausal osteoporosis (the DATA-Switch study): extension</i>	Y
88%	1%	<i>MIR-221-3p is down-regulated in preeclampsia and affects trophoblast growth, invasion and ...</i>	Y
87%	0%	<i>Docosahexaenoic and arachidonic acid concentrations in human breast milk worldwide.</i>	Y
81%	2%	<i>Neuronal microtubule-associated protein 2D is a dual α-kinase anchoring protein expressed in rat ovarian ...</i>	
77%	1%	<i>Neonatal vaginal irritation results in long-term visceral and somatic hypersensitivity ...</i>	Y
76%	3%	<i>Alkaloids and flavonoid glycosides from the aerial parts of <i>Leonurus japonicus</i> and their opposite effects on uterin</i>	Y
75%	2%	<i>Fas-mediated pathway and apoptosis in normal, hyperplastic, and neoplastic endometrium.</i>	Y
71%	1%	<i>Effect of branched-chain fatty acids on fatty acid biosynthesis of human breast cancer cells.</i>	Y
71%	9%	<i>Posttranscriptional control of the competence factor betaFTZ-F1 by juvenile hormone in the mosquito <i>Aedes aegypti</i>.</i>	
67%	5%	<i>Effects of ketamine on the fetal transcriptomic response to umbilical cord occlusion: comparison with ...</i>	
67%	39%	<i>The effect of individual and mixtures of mycotoxins and persistent organochloride pesticides on oestrogen ...</i>	
66%	0%	<i>Complications after autologous fat injection to the breast.</i>	Y
65%	1%	<i>Evaluation of loading parameters for murine axial tibial loading: Stimulating cortical bone formation while ...</i>	
63%	0%	<i>Pregnancy outcomes after maternal exposure to rituximab.</i>	Y
59%	3%	<i>Angiopoietin-1 and vascular endothelial growth factor regulation of leukocyte adhesion to ...</i>	
57%	0%	<i>Frontal fibrosing alopecia in postmenopausal women.</i>	Y
55%	0%	<i>Predicting non-home discharge in epithelial ovarian cancer patients: External validation of a predictive model.</i>	Y
53%	0%	<i>The association between smoking and breast cancer characteristics and outcome.</i>	Y
52%	2%	<i>Combined trastuzumab and paclitaxel treatment better inhibits ErbB-2-mediated angiogenesis in breast c...</i>	Y
48%	11%	<i>Uptake of dietary retinoids at the maternal-fetal barrier: in vivo evidence for the role of lipoprotein lipase and ...</i>	Y
47%	0%	<i>Peri-operative allogeneic blood transfusion is associated with poor overall survival in advanced ...</i>	
46%	0%	<i>ck2-dependent phosphorylation of progesterone receptors (PR) on Ser81 regulates PR-B isoform-specific target ...</i>	
44%	0%	<i>Adaptive neuro-fuzzy inference systems for automatic detection of breast cancer.</i>	Y
43%	16%	<i>Selective cytotoxicity of a Vietnamese traditional formula, Nam Dia long, against MCF-7 cells by synergistic effects.</i>	
39%	93%	<i>An efficient synthesis of 5α-androst-1-ene-3,17-dione.</i>	
38%	1%	<i>Protein phosphatase 3 differentially modulates vascular endothelial growth factor- and fibroblast growth factor...</i>	
38%	1%	<i>Prospective evaluation of the Hybrid Capture 2 and AMPLICOR human papillomavirus (HPV) tests for detection of 13...</i>	
32%	0%	<i>ADA3 regulates normal and tumor mammary epithelial cell proliferation through c-MYC.</i>	Y
31%	0%	<i>Heterogeneous expression of GAGE, NY-ESO-1, MAGE-A and SSX proteins in esophageal cancer: ...</i>	
28%	30%	<i>Steroid receptor expression in the fish inner ear varies with sex, social status, and reproductive state.</i>	
28%	1%	<i>Fragmentation and development of preimplantation porcine embryos derived by parthenogenetic activation and ...</i>	
28%	0%	<i>Renal angiomyolipomas from patients with sporadic lymphangiomatosis contain both neoplastic ...</i>	
24%	0%	<i>Severe aortic insufficiency after transapical aortic valve implantation.</i>	
23%	4%	<i>Transcriptome profiling of genes involving in carotenoid biosynthesis and accumulation between leaf a...</i>	
17%	1%	<i>mPGE2-Dependent Prostaglandin E2 (PGE2) Controls Antigen-Specific Th17 and Th1 Responses by...</i>	
15%	43%	<i>Biosynthesis of the beta-amino acid moiety of the enediyne antitumor antibiotic C-1027 featuring beta-amino ...</i>	
14%	0%	<i>High commitment of embryonic keratinocytes to terminal differentiation through a Notch1-caspase 3 ...</i>	
12%	19%	<i>Stellate ganglion block ameliorates vascular calcification by inhibiting endoplasmic reticulum stress.</i>	
12%	19%	<i>Progress Toward a Semi-Synthetic Organism with an Unrestricted Expanded Genetic Alphabet.</i>	
4%	20%	<i>Halimium halimifolium: From the Chemical and Functional Characterization to a Nutraceutical Ingredient Design.</i>	
4%	6%	<i>Discovery of new [1,4]dioxino[2,3-f]quinazoline-based inhibitors of EGFR including the T790M/L858R mutant.</i>	
3%	5%	<i>Low prevalence of antiretroviral resistance among HIV type 1-positive prisoners in the Southeast United States.</i>	
2%	10%	<i>RT-PCR permits simultaneous genotyping of thiopurine S-methyltransferase allelic variants by multiple...</i>	
1%	1%	<i>Prolonged cyclosporine administration after antithymocyte globulin delays but does not prevent relapse in...</i>	

Table S-37: List of publications with our male-only-trial prediction measure

P(Female Trial)	P(Male Trial)	Patent title	Male Focused?
0%	100%	<i>Augmentation of T cell levels and responses induced by androgen deprivation.</i>	Y
0%	98%	<i>Estrogen blunts neuroendocrine and metabolic responses to hypoglycemia.</i>	
0%	97%	<i>How sensitive is a prostate-specific antigen measurement? How sensitive does it need to be</i>	Y
0%	97%	<i>Insulin-like growth factor 1, chromogranin A and prostate specific antigen serum levels .</i>	Y
0%	96%	<i>Emergence and persistence of CXCR4-tropic HIV-1 in a population of men from...</i>	Y
0%	90%	<i>No Association between the Mitochondrial Genome and Prostate Cancer Risk: ...</i>	Y
6%	89%	<i>Magnetic resonance imaging is a complementary method to stereological measurement of</i>	Y
1%	85%	<i>The effects in mice of combined treatments to X-rays and antineoplastic drugs in the Comet assay.</i>	
0%	84%	<i>Prostate cancer-specific monoclonal antibody 5D4 significantly enhances the cytotoxicity</i>	Y
0%	84%	<i>PEDF protects cardiomyocytes by promoting FUNDC1-mediated mitophagy via PEDF</i>	Y
0%	80%	<i>Pharmacokinetics, disposition, and metabolism of bicifadine in humans.</i>	
8%	75%	<i>The respiratory chain of the thermophilic archaeon Sulfolobus metallicus: studies on the...</i>	
0%	75%	<i>Association of genetic variations of selenoprotein genes, plasma selenium levels, and pro.</i>	Y
4%	73%	<i>Absence of Bcl-2 expression favors response to the short-term administration of diethylstil</i>	Y
4%	73%	<i>Carbenoid reactions of 2-halomethyl-4,6-dimethyl-s-triazines.</i>	
0%	67%	<i>Brefeldin A inhibits cholesterol efflux without affecting the rate of cellular uptake and ...</i>	
8%	64%	<i>Mitochondrial oxidant stress triggers cell death in simulated ischemia-reperfusion.</i>	
4%	62%	<i>Cleavage and synthesis function of high and low redox potential laccases towards 4-morpholinoaniline ...</i>	
0%	62%	<i>The Ceratopteris (fern) developing motile gamete walls contain diverse α-D-glucosylated polysaccharides, but not pectin.</i>	
1%	62%	<i>Identification and expression of mangrove rivulus (Kryptolebias marmoratus) histone deacetylase...</i>	
3%	59%	<i>Efficacy of sildenafil as adjuvant therapy... inhibitor in alleviating premature ejaculation</i>	Y
2%	55%	<i>Characterization of the mechanism and magnitude of cytoglobin-mediated nitrite reduction ...</i>	
3%	54%	<i>Estimation of the hydrophobicity of 2,4-diphenyl-1,3-oxazoline analogs and QSAR analysis of...</i>	
6%	53%	<i>COSMO-RS for the prediction of the retention behavior in micellar liquid chromatography based ...</i>	
6%	52%	<i>Western Diet Triggers NLRP3-Dependent Innate Immune Reprogramming.</i>	
1%	48%	<i>Duration of action of a broad range of selective κ-opioid receptor antagonists is positively...</i>	
6%	47%	<i>Continuous 24-h nicotinic acid infusion in rats causes FFA rebound and insulin resistance by...</i>	
7%	47%	<i>Flavin-containing enzymes as a source of reactive oxygen species in HEMA-induced apoptosis.</i>	
7%	43%	<i>A highly specific and ultrasensitive probe for the imaging of inflammation-induced endogenous ...</i>	
2%	42%	<i>Shear stress-induced mitochondrial biogenesis decreases the release of microparticles from endothelial cells.</i>	
3%	39%	<i>Aorta and liver changes in rats fed cholesterol-containing and raw vegetable-supplemented diets:...</i>	
0%	35%	<i>Tumor length in prostate cancer.</i>	Y
13%	33%	<i>Structure-activity relationships of peptides incorporating a bioactive reverse-turn heterocycle ...</i>	
3%	33%	<i>Correlation of pQCT bone strength index with mechanical testing in distraction osteogenesis.</i>	
1%	31%	<i>Essential role of the cAMP-cAMP response-element binding protein pathway in opiate-induced ...</i>	
9%	28%	<i>Synthesis and biological evaluation of 7-O-modified oroxylin A derivatives.</i>	
0%	28%	<i>Game of Somes: Protein Destruction for Mycobacterium tuberculosis Pathogenesis.</i>	
5%	27%	<i>Structures of Leishmania major pteridine reductase complexes reveal the active site features...</i>	
1%	23%	<i>GTP binding and hydrolysis kinetics of human septin 2.</i>	
9%	22%	<i>Association of DRD2, 5-HTTLPR, and 5-HTT VNTR Gene Polymorphisms With Posttraumatic Stress ...</i>	
2%	19%	<i>Near-native structure refinement using in vacuo energy minimization.</i>	
12%	16%	<i>Proteome profile of the developing maize (Zea mays L.) rachis.</i>	
4%	15%	<i>GUCY2C Signaling Opposes the Acute Radiation-Induced GI Syndrome.</i>	
4%	13%	<i>Piracetam, an AMPA/kine drug, facilitates memory consolidation in the day-old chick.</i>	
3%	11%	<i>Precision is essential for efficient catalysis in an evolved Kemp eliminase.</i>	
0%	8%	<i>Structural investigation of the HIV-1 envelope glycoprotein gp160 cleavage site.</i>	
2%	5%	<i>Cystic fibrosis transmembrane conductance regulator: a molecular model defines the...</i>	
1%	3%	<i>Scintigraphic detection of pulmonary aspergillosis in rabbits with a radiolabeled leukotriene b4...</i>	
0%	1%	<i>An Exploratory Study of Dapagliflozin for the Attenuation of Albuminuria in Patients with Heart ...</i>	
0%	0%	<i>Aeromonas species: an opportunistic enteropathogen in patients with inflammatory bowel diseases?...</i>	

Table S-38: Papers tagged as female are more likely to describe ideas that would require a female-only clinical trial; papers tagged as male are more likely to require a male-only clinical trial

Dependent Variables: Model:	P(Female Trial) (1)	P(Female Trial) (2)	P(Female Trial) > 80% (3)	P(Male Trial) (4)	P(Male Trial) (5)	P(Male Trial) > 80% (6)
<i>Variables</i>						
Female MeSH	7.2*** (0.03)	15*** (0.05)	10.7*** (0.05)		-14.6*** (0.04)	-4.8*** (0.03)
Male MeSH		-13.5*** (0.04)	-8.8*** (0.04)	1.1*** (0.03)	9.3*** (0.04)	5.6*** (0.04)
(Intercept)	4*** (0.006)	6.5*** (0.010)	1.7*** (0.008)	9.6*** (0.01)	11.8*** (0.01)	0.96*** (0.007)
<i>Fit statistics</i>						
Observations	1,952,617	1,952,617	1,952,617	1,952,617	1,952,617	1,952,617
R ²	0.04692	0.16022	0.09314	0.00107	0.12327	0.04098

Robust standard-errors in parentheses

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-39: Publications by women are not more likely to focus on the medical needs of men

Dependent Variable: Model:	(1)	Male Research		
	(2)	(3)	(4)	
<i>Variables</i>				
Minority Female	-0.28*** (0.08)	-0.90*** (0.16)		
Majority Female	-0.94*** (0.08)		-1.3*** (0.18)	
All Female	0.24 (0.13)			0.80* (0.32)
<i>Fixed-effects</i>				
Year×Team Size	Yes	Yes	Yes	Yes
Year×Disease		Yes	Yes	Yes
Year×Journal	Yes	Yes	Yes	Yes
Year×Team Size×Disease		Yes	Yes	Yes
<i>Exact Matching</i>				
Year×Team Size×Disease		Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	2,062,695	372,222	291,986	119,650
R ²	0.36702	0.40399	0.43772	0.50051
<i>Robust standard-errors in parentheses. Columns 2-4 matching weighted</i>				
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>				

Table S-40: Women are more likely to discover for women regardless of the Journal Commercialization Impact Factor (JCIF) of the journal where the article is published

Dependent Variable: Model:	(1)	(2)	(3)	Female Research		(6)	(7)	(8)
				(4)	(5)			
<i>Variables</i>								
Minority Female	1.1*** (0.05)	0.89*** (0.08)	0.84*** (0.08)	0.94*** (0.13)	0.52*** (0.10)	0.80*** (0.20)	0.73*** (0.19)	0.53 (0.57)
Majority Female	3.5*** (0.05)	2.4*** (0.08)	3*** (0.08)	2.2*** (0.14)	2.7*** (0.10)	2*** (0.21)	3.9*** (0.20)	2.9*** (0.59)
All Female	5.2*** (0.07)	4.2*** (0.11)	4.5*** (0.12)	4.1*** (0.22)	3.8*** (0.16)	3.8*** (0.35)	4.2*** (0.33)	3.3*** (0.96)
<i>Fixed-effects</i>								
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Journal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease Area		Yes		Yes		Yes		Yes
<i>Sample Restrictions</i>								
JCIF Cut	All	All	1,000	1,000	500	500	100	100
<i>Fit statistics</i>								
Observations	5,529,360	2,727,870	2,062,695	975,653	1,121,807	447,171	240,848	74,212
R ²	0.36365	0.30799	0.3632	0.34524	0.32719	0.37344	0.22874	0.4465
<i>Robust standard-errors in parentheses</i>								
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>								

Table S-41: The findings in Figure 4B hold when match on journal instead of disease area

Dependent Variable: Model:	(1)	(2)	Female Research			
			(3)	(4)	(5)	(6)
<i>Variables</i>						
Minority Female	1.2*** (0.10)			0.77*** (0.16)		
Majority Female		3.3*** (0.10)			2.5*** (0.18)	
All Female			4.6*** (0.14)			3.8*** (0.34)
<i>Fixed-effects</i>						
Year×Team Size	Yes	Yes	Yes	Yes	Yes	Yes
Year×Disease				Yes	Yes	Yes
Year×Journal	Yes	Yes	Yes	Yes	Yes	Yes
Year×Team Size×Journal	Yes	Yes	Yes	Yes	Yes	Yes
<i>Exact Matching</i>						
Year×Team Size×Journal	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	979,340	891,618	462,530	469,294	381,101	170,918
R ²	0.40456	0.40502	0.4001	0.42092	0.45423	0.52368

Robust standard-errors in parentheses. All columns are matching weighted.

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-42: Publication regressions testing heterogeneity by time-period and authorship order

Dependent Variable:	Female Research		
Model:	(1)	(2)	(3)
<i>Variables</i>			
Minority Female	1.5*** (0.17)	1.4*** (0.21)	1.7*** (0.29)
Majority Female	2.4*** (0.26)	2.4*** (0.35)	2.3*** (0.42)
All Female	7.0*** (0.34)	6.9*** (0.44)	7.1*** (0.52)
Minority Female×Female First Author	0.23 (0.17)	0.49* (0.22)	-0.17 (0.26)
Minority Female×Female Last Author	0.24 (0.22)	0.16 (0.29)	0.35 (0.33)
Majority Female×Female First Author	0.63** (0.23)	0.77* (0.31)	0.45 (0.35)
Majority Female×Female Last Author	1.1*** (0.22)	1.1*** (0.30)	1.2*** (0.32)
Sample Restriction		2002-2012	2013-2020
<i>Fixed-effects</i>			
Year×Journal	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes
Year×Disease Area	Yes	Yes	Yes
<i>Sample Restrictions</i>			
Restriction		2002-2012	2013-2020
<i>Fit statistics</i>			
Observations	679,559	423,482	256,077
R ²	0.35926	0.34039	0.3851
<i>Robust standard-errors in parentheses</i>			
<i>Signif. Codes: ***: 0.001, **: 0.01, *: 0.05</i>			

Table S-43: Women are more likely to discover for women when using alternative measures of a paper's sex focus

Dependent Variables: Model:	Log Female Incidence (1)	P(Female Trial) (2)	P(Female Trial) > 80% (3)	Log Male Incidence (4)	P(Male Trial) (5)	P(Male Trial) > 80% (6)
<i>Variables</i>						
Minority Female	0.08*** (0.01)	0.19*** (0.03)	0.05* (0.02)	-0.05*** (0.01)	0.02 (0.03)	0.05* (0.02)
Majority Female	0.45*** (0.01)	2*** (0.03)	1.4*** (0.03)	-0.44*** (0.01)	-0.31*** (0.03)	-0.09*** (0.02)
All Female	0.47*** (0.02)	2.6*** (0.06)	1.8*** (0.06)	-0.49*** (0.02)	-0.26*** (0.05)	-0.06 (0.04)
Log Male Incidence	0.68*** (0.002)					
Log Female Incidence				0.67*** (0.002)		
<i>Fixed-effects</i>						
Year × Team Size	Yes	Yes	Yes	Yes	Yes	Yes
Year × Journal	Yes	Yes	Yes	Yes	Yes	Yes
<i>Fit statistics</i>						
Observations	581,831	1,952,617	1,952,617	581,831	1,952,617	1,952,617
R ²	0.61144	0.2343	0.16514	0.61157	0.21505	0.09032

Robust standard-errors in parentheses
Signif. Codes: ***: 0.001, **: 0.01, *: 0.05

Table S-44: The findings in Figure 4B of paper hold when we instead use our clinical-trial measure of a paper's sex focus

Dependent Variable: Model:	Female Clinical Trial Research			
	(1)	(2)	(3)	(4)
<i>Variables</i>				
Minority Female	0.19*** (0.03)	0.72*** (0.05)		
Majority Female	2*** (0.03)		2.5*** (0.08)	
All Female	2.6*** (0.06)			3.2*** (0.15)
<i>Fixed-effects</i>				
Year×Team Size	Yes	Yes	Yes	Yes
Year×Disease		Yes	Yes	Yes
Year×Journal	Yes	Yes	Yes	Yes
Year×Team Size×Disease		Yes	Yes	Yes
<i>Exact Matching</i>				
Year×Team Size×Disease		Yes	Yes	Yes
<i>Fit statistics</i>				
Observations	1,952,617	354,733	273,389	105,649
R ²	0.2343	0.49746	0.52655	0.58685

Robust standard-errors in parentheses. Columns 2-4 matching weighted
*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-45: Patents by women are more likely to commercialize female focused papers

Dependent Variables:	Patent-Paper Pair		NIH Grant	
Family Model:	OLS (1)	Logit (2)	OLS (3)	Logit (4)
<i>Variables</i>				
Minority Female	1.5* (0.76)	0.10* (0.05)	1.7 (0.86)	0.19 (0.10)
Majority Female	2.1** (0.80)	0.13** (0.05)	3.4*** (0.86)	0.38*** (0.09)
All Female	3.3* (1.5)	0.20* (0.09)	8.6*** (1.7)	0.79*** (0.13)
<i>Fixed-effects</i>				
Year×Subcategory	Yes	Yes	Yes	Yes
Year×Team Size	Yes	Yes	Yes	Yes
Number of Matched Publications by Inventors	Yes	Yes		
Number of Matched NIH Articles			Yes	Yes
Observations	22,666	22,238	12,834	11,554

Robust standard-errors in parentheses

*Signif. Codes: ***: 0.001, **: 0.01, *: 0.05*

Table S-46: The number of female-focused and male-focused patents by whether the inventors are majority women (greater than or equal to 50%) or majority men (strictly greater than 50%)

	Female-focused patent	Male-focused patent	Not sex-focused
Male-majority team	46,453	49,886	295,906
Female-majority team	8,246	7,053	43,947

Table S-47: Summary statistics for our patent data

Variable	Mean	Median	Std.Dev.	Max	Min	N
Team Size	2.88	2.00	2.13	33.00	1.00	430,060
Year	1998.10	1999.00	8.36	2010.00	1976.00	430,060
Female Mesh	0.13	0.00	0.33	1.00	0.00	430,060
Male Mesh	0.13	0.00	0.34	1.00	0.00	430,060
Minority Female Team	0.15	0.00	0.36	1.00	0.00	430,060
Majority Female Team	0.09	0.00	0.29	1.00	0.00	430,060
All Female Team	0.04	0.00	0.19	1.00	0.00	430,060

Table S-48: Summary statistics for our publication data

Variable	Mean	Median	Std.Dev.	Max	Min	N
Team Size	6.18	5.00	5.04	719.00	1.00	2,062,695
Year	2010.36	2010.00	5.05	2020.00	2002.00	2,062,695
Female Mesh	0.37	0.00	0.48	1.00	0.00	2,062,695
Male Mesh	0.39	0.00	0.49	1.00	0.00	2,062,695
Minority Female Team	0.39	0.00	0.49	1.00	0.00	2,062,695
Majority Female Team	0.25	0.00	0.44	1.00	0.00	2,062,695
All Female Team	0.06	0.00	0.23	1.00	0.00	2,062,695

Table S-49: Summary statistics for our patent data, 2002–2010

Variable	Mean	Median	Std.Dev.	Max	Min	N
Team Size	3.23	3.00	2.38	33.00	1.00	168,888
Year	2005.93	2006.00	2.61	2010.00	2002.00	168,888
Female Mesh	0.14	0.00	0.35	1.00	0.00	168,888
Male Mesh	0.14	0.00	0.35	1.00	0.00	168,888
Minority Female Team	0.19	0.00	0.39	1.00	0.00	168,888
Majority Female Team	0.11	0.00	0.31	1.00	0.00	168,888
All Female Team	0.04	0.00	0.20	1.00	0.00	168,888

Table S-50: Summary statistics for our publication data, 2002–2010

Variable	Mean	Median	Std.Dev.	Max	Min	N
Team Size	5.55	5.00	3.94	416.00	1.00	1,050,868
Year	2006.06	2006.00	2.54	2010.00	2002.00	1,050,868
Female Mesh	0.33	0.00	0.47	1.00	0.00	1,050,868
Male Mesh	0.36	0.00	0.48	1.00	0.00	1,050,868
Minority Female Team	0.38	0.00	0.49	1.00	0.00	1,050,868
Majority Female Team	0.23	0.00	0.42	1.00	0.00	1,050,868
All Female Team	0.05	0.00	0.22	1.00	0.00	1,050,868

← Exit

Open structure breast coil and support arrangement for interventional MRI

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Patent info

Open structure breast coil and support arrangement for interventional MRI

A pair of RF quadrature detection coils are fitted in an open support structure that allows easy diagnostic access to all tissue areas of the human female breast when performing interventional MRI. The open structure dual coil arrangement comprises a flat base and a slightly V-shaped bi-planar upper section supported above the lower base section by eight narrow vertical legs. The upper bi-planar section includes two circular openings for accepting the breasts. Four of the support legs are equally spaced at 900 intervals around each breast opening and provide large side-open access areas to the breast tissues via the sides of the support structure. The V-shape of the upper portion of the coil support structure increases the gap clearance at both left and right sides of the support structure to further enhance access to the breasts. In a preferred embodiment, two complete MRI quadrature detection coils are supported by the structure and each of the vertical support legs house a pair of conductors forming part of a quadrature detection coil winding. The use of quadrature detection coils increases MRI signal detection efficiency and the open structural support arrangement allows increased accessibility to the breast tissues for efficient interventional MR imaging and easy cleaning after use. This invention relates to open structure RF receive coils and an associated support structure for magnetic resonance imaging (MRI). More specifically, it relates to a quadrature type receive coils and associated support structures for obtaining MR images of the human breast which allows ample access to the breast tissues for permitting interventional MRI procedures. Magnetic resonance (MR) images acquired during surgery can assist a surgeon to accurately locate tissue malignancies, obtain a biopsy from desired locations and ensure successful tissue removal. Interventional MRI is the magnetic resonance imaging technique (often involving real-time imaging) that allows a surgeon to perform MRI-guided tissue biopsy or surgery. One application of interventional MRI is to guide a surgeon during a biopsy or surgical operation on one or both of the breasts of female patients. Interventional MRI procedures typically require that an MR signal detection coil have large openings so that a surgeon can have access to the surgical site through the coil with biopsy needle

MeSH Terms

FEMALE

☐ Delete

Rank: 1

HUMANS

[B01.050.150.90
0.649.313.988.4
00.112.400.400]

☐ Delete

Rank: 1

MALE

☒ Delete

PRE-ASSIGNED MESH TERMS

BREAST

[A01.236]

☐ Delete

Rank: 3

MAGNETIC RESONANCE IMAGING, INTERVENTIONAL

[E04.502.515]

☐ Delete

Rank: 4

MAGNETIC RESONANCE IMAGING

[E01.370.350.825.500]

☐ Delete

Rank: 5

PHANTOMS, IMAGING

[E07.671]

☐ Delete

Rank: 6

SURGERY

☐ Delete

Rank: 7

BIOPSY

[E05.200.500.384.100]

☐ Delete

Rank: 8

BIOPSY, NEEDLE

[E05.200.500.384.100.119]

☐ Delete

Rank: 9

RADIO WAVES

[G01.358.500.505.810]

☐ Delete

Rank: 10

EQUIPMENT DESIGN

[E05.320]

☐ Delete

IMAGE-GUIDED BIOPSY

[E01.370.225.998.054.370]

☐ Delete

Figure S-1: Screenshot from the web app used by human medical indexers to evaluate our algorithm. The human, female, and male check tags were always displayed at the top, irrespective of whether the MTI classified the patent as matching these tags.

Patent info

Targets for breast cancer diagnosis and treatment

cDNA sequences derived from four novel genes associated with breast cancer are provided. In over about 60% of the cancer cell lines tested, RNA hybridizing with the cDNAs were substantially more abundant than in normal cells. Most of the cell lines also showed a duplication of the corresponding gene, which probably contributed to the increased level of RNA in the cell. However, for each of the four genes, there were some cell lines which had RNA overabundance without gene duplication. This suggests that the gene product is sufficiently important to the cancer process that cells will use several alternative mechanisms to achieve increased expression. The polynucleotides, polypeptides, and antibodies provided by this invention are expected to be particularly useful in diagnosis and treatment of breast cancer. Also provided is a general method for obtaining cDNA with similar properties that may be associated with breast cancer and other malignancies. The present invention relates generally to the field of human genetics. More specifically, it relates to the identification of novel genes associated with overabundance of RNA in human cancer, particularly breast cancer. It pertains especially to those genes and the products thereof which may be important in diagnosis and treatment. One of the most pressing health issues today is breast cancer. In the industrial world, about one woman in every nine can expect to develop breast cancer in her lifetime. In the United States, it is the most common cancer amongst women, with an annual incidence of about 175,000 new cases and nearly 50,000 deaths. Despite an ongoing improvement in our understanding of the disease, breast cancer has remained resistant to medical intervention. Most clinical initiatives are focused on early diagnosis, followed by conventional forms of intervention, particularly surgery and chemotherapy. Such interventions are of limited success, particularly in patients where the tumor has undergone metastasis. There is a pressing need to improve the arsenal of therapies available to provide more precise and more effective treatment in a less invasive way. A promising area for the development of new modalities has emerged from recent understanding of the genetics of cancer. Alteration of gene expression is intimately related to the uncontrolled growth and differentiation that are hallmarks of the disease. There are two classes of

POPULATION GROUPS

[M01.686]

Rank: 26

☐ Delete

DIAGNOSIS

[E01]

Rank: 28

☐ Delete

METHODS

[E05.581]

Rank: 28

☐ Delete

INDUSTRY

[J01.576]

Rank: 28

☐ Delete

PRESSURE

[G01.374.715]

Rank: 28

☐ Delete

SEXUAL BEHAVIOR

[F01.145.802]

Rank: 28

☒ Delete

ACHIEVEMENT

[F01.658.059]

Rank: 33

☒ Delete

TIME

[G01.910]

Rank: 33

☒ Delete

INTERPERSONAL RELATIONS

[F01.829.401]

Rank: 33

☒ Delete

ADDITIONAL MESH TERMS

Search MeSH Terms

COMMENTS

Submit

Figure S-2: Screenshot from the web app used by human medical indexers to evaluate our algorithm. The top 40 MeSH tags that the MTI assigned to the patent were displayed. The indexers could delete tags they thought did not apply to the patent.

Patent info

Sugar transport sequences, yeast strains having improved sugar uptake, and methods of use

Disclosed are nucleic acid constructs comprising coding sequences operably linked to a promoter not natively associated with the coding sequence. The coding sequences encode Pichia stipitis proteins that allow recombinant strains of Saccharomyces cerevisiae expressing the protein to grow on xylose, and allow or increase uptake of xylose by Pichia stipitis or Saccharomyces cerevisiae expressing the coding sequences. Expression of the coding sequences enhances uptake of xylose and/or glucose, allowing increased ethanol or xylitol production. Within the United States, ongoing res is directed toward developing alternative energy sources to reduce our dependence on foreign oil and nonrenewable energy. The use of ethanol as a fuel has become increasingly prevalent in recent years. Currently, corn is the primary carbon source used in ethanol production. The use of corn in ethanol production is not economically sustainable and, arguably, may result in increased food costs. In order to meet the increased demand for ethanol, it will be necessary to ferment sugars from other biomass, such as agricultural wastes, corn hulls, corncobs, cellulosic materials, pulping wastes, fast-growing hardwood species, and the like. Biomass from most of these sources contains large amounts of xylose, constituting about 20 to 25% of the total dry weight. Because agricultural residues have a high xylose content, the potential economic and ecologic benefits of converting xylose in these renewable materials to ethanol are significant. In biomass conversion, microorganisms serve as biocatalysts to convert cellulosic materials into usable end products such as ethanol. Efficient biomass conversion in large-scale industrial applications requires a microorganism that can tolerate high sugar and ethanol concentrations, and which is able to ferment multiple sugars simultaneously. The pentose D-xylose is significantly more difficult to ferment than D-glucose. Bacteria can ferment pentoses to ethanol and other co-products, and bacteria with improved ethanol production from pentose sugars have been genetically engineered. However, these bacteria are sensitive to low pH and high concentrations of ethanol, their use in fermentations is associated with co-product formation, and the level of ethanol produced remains too low to make the use of these bacteria in large-scale ethanol production

Rank: 31

ECOLOGY
[H01.277.249]
Rank: 32

PROMOTER REGIONS, GENETIC
[G02.111.570.080.689.675]
Rank: 35

BIOLOGICAL FACTORS
[D23]
Rank: 37

DISSENT AND DISPUTES
[F02.463.785.373.476]
Rank: 38

Rank: 32

BODY WEIGHT
[C23.888.144]
Rank: 34

HYDROLASES
[D08.811.277]
Rank: 35

DISCLOSURE
[F01.829.401.046]
Rank: 38

COSTS AND COST ANALYSIS
[N03.219.151]
Rank: 38

ADDITIONAL MESH TERMS

sugar|

AMINO SUGARS

CARBA SUGARS

COUPLING SUGAR

DEOXY SUGARS

DIETARY SUGARS

GUANOSINE DIPHOSPHATE SUGARS

IMINO SUGARS

INVERT SUGAR

NEO SUGAR

NUCLEOSIDE DIPHOSPHATE SUGARS

PHOSPHONIC DIPHOSPHATE SUGAR PHOSPHOTRANSFERASE SYSTEM

Figure S-3: Screenshot from the web app used by human medical indexers to evaluate our algorithm. At the bottom of the screen the indexers could add MeSH terms that they thought the MTI had missed. The text box would auto-complete the terms they typed, to ensure they were adding a valid MeSH tag.

Figure S-4: These estimates show the increased chance, in percentage points, that a female-invented patent is **male**-focused, compared to a patent from an all-male invention team. Black estimates are from models estimated using OLS with year×subcategory and year×team-size fixed effects. The blue estimates are from models that match teams with female inventors to all male teams using the patent's year, subcategory, team size, and disease focus. The bars show robust 95% and 99% confidence intervals. The full sample includes 430,060 patents; the largest matched sample includes 45,751 patents.

Figure S-5: These estimates show the increased chance, in percentage points, that a female-invented patent is female-focused, compared to a patent from an all-male invention team. Black estimates come from models that are estimated using OLS with year×subcategory and year×team-size fixed effects. The blue estimates are from models that match teams with female inventors to all-male teams using the patent's year, subcategory, team size, and disease focus. The bars show robust 95% and 99% confidence intervals. The full sample includes 430,060 patents; the largest matched sample includes 45,751 patents.

Figure S-6: Annual percentage of U.S. *drug* biomedical patents by inventor-team gender and the sex focus of the patent. Female-majority teams are those with 50% or more female inventors on the patent. Data on inventor gender comes from a dictionary-match analysis of inventor names from PatentsView. Data on the sex focus (if any) of patents comes from passing patent text through the National Library of Medicine's Medical Text Indexer. A patent is coded male- or female-focused if the MTI returns "Male" or "Female" as one of its top Medical Subject Headings, or "MeSH," terms.

Figure S-7: Annual percentage of U.S. *surgery and instrument* biomedical patents by inventor-team gender and the sex focus of the patent. Female-majority teams are those with 50% or more women inventors on the patent. Data on inventor gender comes from a dictionary-match analysis of inventor names from PatentsView. Data on the sex focus (if any) of patents comes from passing patent text through the National Library of Medicine's Medical Text Indexer. A patent is coded male- or female-focused if the MTI returns "Male" or "Female" as one of its top Medical Subject Headings, or "MeSH," terms.

Figure S-8: Estimated number of female-focused inventions that are lost each year through the under-representation of women in invention.