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The Contraceptive Product Pipeline: Where We Are and What We've Learned

[version 1]

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Abstract

The contraceptive research and development (R&D) landscape is complex, fragmented, and often opaque, making it difficult for stakeholders to track progress and identify opportunities for innovation. To address this, FHI 360 led a comprehensive update and redesign of the Contraceptive Technology Innovation (CTI) Tracker—a global database that maps contraceptive leads and products across discovery, pre-clinical, clinical, and early market stages. This effort, conducted from April 2024 to February 2025, involved systematic review of 243 existing entries, integration of 59 new records, and refinement of inclusion criteria through expert consultation. The updated CTI Tracker now includes 122 active and 95 archived contraceptive programs, offering insights into product characteristics, development stages, and developer types. By enhancing transparency and usability, the CTI Tracker serves as a dynamic resource to inform strategic investment, foster cross-sector collaboration, and accelerate the development of next-generation contraceptive options.

Keywords

Contraceptive R&D, Contraceptive Technology, Contraception



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Introduction

Pharmaceutical research and development, even when conducted in non-profit and academic contexts, is often a “black box” – ideas go in and products come out, but the inner workings are difficult to understand and track. To bring greater transparency to contraceptive innovation, leading research and knowledge exchange organizations – the Jackson Laboratory (Motenko et al., 2015), Baylor College of Medicine (Deras et al., 2022), NICHD (Sinha et al., 2021), the Male Contraceptive Initiative (n.d.), FHI 360 (2025), and the Initiative for Multipurpose Prevention Technologies (2024) – have created databases that illuminate various pieces of the product pipeline (see Figure 1 for a summary of how these databases overlap and fill gaps). From pre-development genomics data to potential drug targets, to leads and drug candidates, to tested products preparing for regulatory approval, these databases complement one another to map the full contraceptive development process.

Serving as a bridge across multiple partner data sources, the CTI Tracker — hosted on the Contraceptive Technology Innovation (CTI) Exchange (Hoppes et al., 2025) — offers a comprehensive (though not exhaustive) view of contraceptive programs in the discovery, pre-clinical, and clinical stages of development, as well as products approved in only one country with the potential for additional regulatory approvals. It also preserves an archive of leads or products no longer in active development. Motivated by a desire to improve cross-organizational collaboration, knowledge exchange, and decision-making in contraceptive R&D, FHI 360 led a redesign and structured update process for the CTI Tracker from April 2024 through February 2025.

Methods

To create a more comprehensive, user-friendly, and up-to-date contraceptive pipeline database, we systematically reviewed each entry in a foundational repository of contraceptive targets, leads, and products maintained by FHI 360 since 2011. Updates were based on peer-reviewed literature, developer websites and reports, and official press releases. Records were marked inactive if no development activity was evident in the past five calendar years or if the developer had confirmed discontinuation. These inactive records were moved to an archive section of the database.

An expert panel of developers and philanthropic organizations helped refine the database scope, define inclusion criteria, and review content. It was decided that the database would include both contraceptive products and leads, but would exclude biological targets, veterinary-only products, fertility tracking tools, and products with WHO prequalification or approval in more than one country. The expert group developed definitions for contraceptive products and leads to ensure clear inclusion and exclusion criteria (see Figure 2). A portion of the foundational repository records were removed to align the newly constructed database with this refined, clarified scope.

To identify new entries, we monitored media via Google alerts, attended scientific meetings, and searched PubMed (2019-present since the database was last updated in 2018; see Figure 3 for search strategy). We also cross-checked findings with the Non-Hormonal, Reversible Male Contraception (NHRMC) Database, the Multipurpose Prevention Technologies (MPT) Product Development Database, clinicaltrials.gov, and NIH and Gates Foundation grantee lists.

The following information was collected and updated for each contraceptive record: lead or product name(s), female/male-controlled products, hormonal/non-hormonal, delivery type, intended duration, development stage, developer(s)/

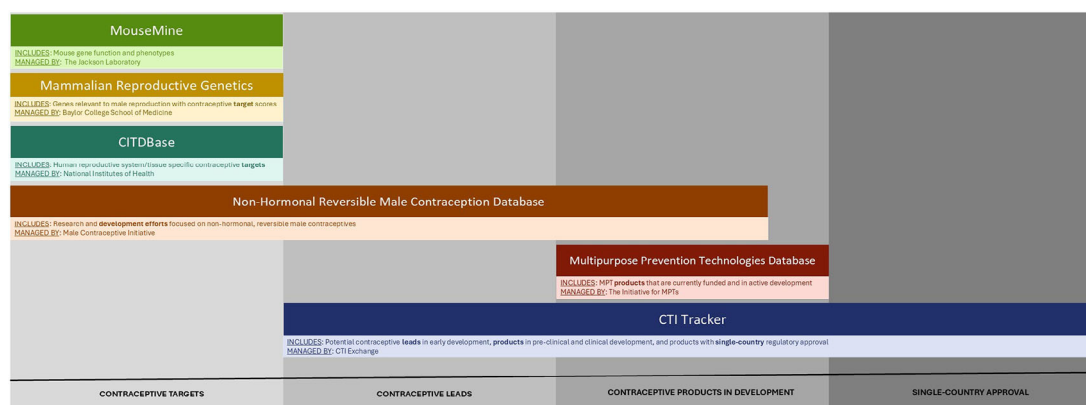


Figure 1. Contraceptive target, lead, and product databases.

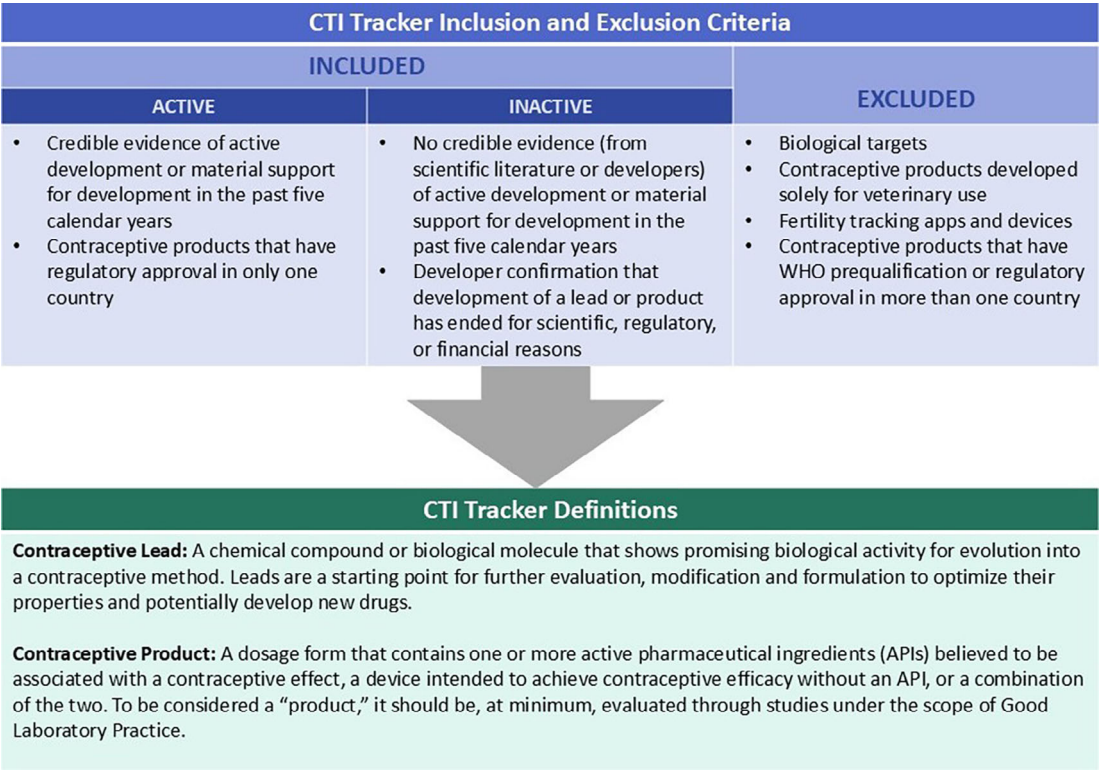


Figure 2. CTI tracker criteria and definitions.

(contraceptive agents[Majr] OR contraceptive devices[Majr] OR hormonal contraception[Majr] OR contraceptive agents, hormonal[Majr] OR "non-hormonal contraceptives"[tiab] OR "non-hormonal contraceptive"[tiab] OR contraceptive agents, female[Majr] OR contraceptive devices, female[Majr] OR contraceptive agents, male[Majr] OR contraceptive devices, male[Majr] OR "male contraceptives"[tiab] OR "male contraceptive"[tiab] OR contracept*[tiab] OR "multipurpose prevention technologies"[tiab])
AND (drug development[Majr] OR "in development"[tiab] OR new[tiab] OR innovat*[tiab] OR novel[tiab] OR emerging[tiab])
NOT cancer NOT neoplasms NOT polycystic ovary syndrome NOT endometriosis NOT (pmcbook OR pubmed books[sb])
AND 2019/01/01:2024/12/31[dp]

Figure 3. CTI tracker PubMed search strategy.

researcher(s), as well as additional product details, known development history, a selection of relevant publications, and links to additional information.

A redesigned, searchable user interface was developed with filters, a glossary, and a “how to” guide. The expert panel reviewed the interface and provided feedback. Where possible, developers were contacted to verify and update records. The CTI Tracker is updated as new information becomes available and undergoes a comprehensive annual review with expert input to ensure it remains a reliable resource for the contraceptive R&D community.

Findings

After conducting a full review of the initial 243-entry database and building in new leads and products, the finalized data set contained 122 active contraceptive programs and 95 inactive (archived) programs. Of the initial 243 entries, 91 products were determined to be inactive, predominantly because there was no indication of active development from credible sources in more than five years. For a smaller number of records, developers directly confirmed inactive status or published literature/press releases confirmed they were no longer believed to be scientifically viable or had safety profiles incompatible with further development (see [Figure 4](#) for additional details). Overall, 85 records were removed from the database because they were found to no longer be in-scope, based on the criteria discussed above. 67 of the original 243 records were determined to be under active development and in-scope.

A total of 59 new records – 55 active and 4 inactive - were added to the database (see [Figure 4](#) for additional details).

The current contraceptive product pipeline

The CTI Tracker currently provides information for 122 contraceptive programs in active development (see [Figure 5](#) for summary) and 95 that are inactive. Of the active programs, nearly one in four (29 entries) are for male methods and one in four (31 entries) have potential as MPTs.

The current distribution of active products across phases of research reflects the inherently lengthy and complex nature of product development. The largest portion of active products (57 entries, 47%) are in pre-clinical development, while 29% (35) are in active clinical development, and 19% (23) are in discovery or early development. This distribution underscores the long and resource-intensive process of investigational new drug (IND)-enabling pre-clinical evaluation, which includes extensive *in vitro* and *in vivo* testing to establish safety and efficacy (U.S. Food & Drug Administration, n.d.). Among inactive products, development stalled during discovery and early development for 30%, at the pre-clinical stage for 28%, and during clinical stages for 42%. Attrition could be attributed to a range of factors, including fundraising or challenges in demonstrating promising safety or efficacy outcomes.

There are a total of 237 different developer/researcher organizations listed in the CTI Tracker database. The number of organizations is larger than the number of entries because researchers often collaborate on programs. A majority of organizations (40%, 94) are universities or medical centers, followed by non-profits and funder-developers at 24% (56), and start-ups and small for-profits at 21% (48). The smallest representation came from larger for-profit pharmaceutical companies (15%, 35). This may be partially attributed to their tendency to maintain confidentiality around product development activities, but analysis of funding trends does suggest a withdrawal of large for-profit companies from contraceptive R&D ([Impact Global Health, 2025](#)). While the predominance of academic research institutions in contraceptive R&D is not surprising, the notably high representation of non-profit and funder-developer organizations is distinctive and underscores a unique characteristic of the contraceptive innovation landscape, especially compared to other areas of women's health and "FemTech" ([Nature, 2025](#)).

A small majority (58%, 74) of lead/product entries are designed to be short-acting or used "on-demand," compared to 29% (35) that are intended for continuous use/long-acting or permanent contraception. While the remaining 13% have undetermined durations. Among the 106 entries with a defined delivery type, the most common are oral (17), vaginal rings (15), and intrauterine devices (14). Notably, 25% of all active records involve vaginal delivery systems—such as rings, gels, and other platforms. This may reflect factors like streamlined regulatory pathways or lower manufacturing costs, though the trend is likely driven by a combination of influences. New and refined delivery platforms, such as microneedles ([Vora et al., 2024](#)), biodegradable platforms ([Saltzman et al., 2023](#)), and self-aggregating microcrystals ([Feig et al., 2025](#)), are also expanding the potential for user-controlled design and long-acting formulations. Amongst the most common delivery types were intrauterine devices (13%), which also represent an area of active innovation, with researchers exploring ways to improve comfort and accessibility through smaller sizes, novel shapes, and new materials.

The evolution of the contraceptive product pipeline

After a seven-year gap in updating the contraceptive pipeline database, this review provides new insights into how the field has evolved. While the proportion of male methods remains similar across both active and inactive products, recent funding trends suggest a gradual increase in investment in male contraception ([Impact Global Health, 2025](#)). A modest rise in the number of products with potential as MPTs, now comprising 22% of the pipeline, also points to emerging areas of growth. Conversely, the share of continuous-use/long-acting methods appears to have declined, from 34% to 26% of records, over the review period (2017-2024). The balance between hormonal and non-hormonal approaches has remained relatively stable at approximately 50/50. However, if you look at only active male programs, 90% are nonhormonal, vs. 50% of inactive products, indicating a significant shift. Notably, 27 products underwent transitions in developer ownership or research team composition, sometimes multiple times, highlighting a degree of volatility within the field. A

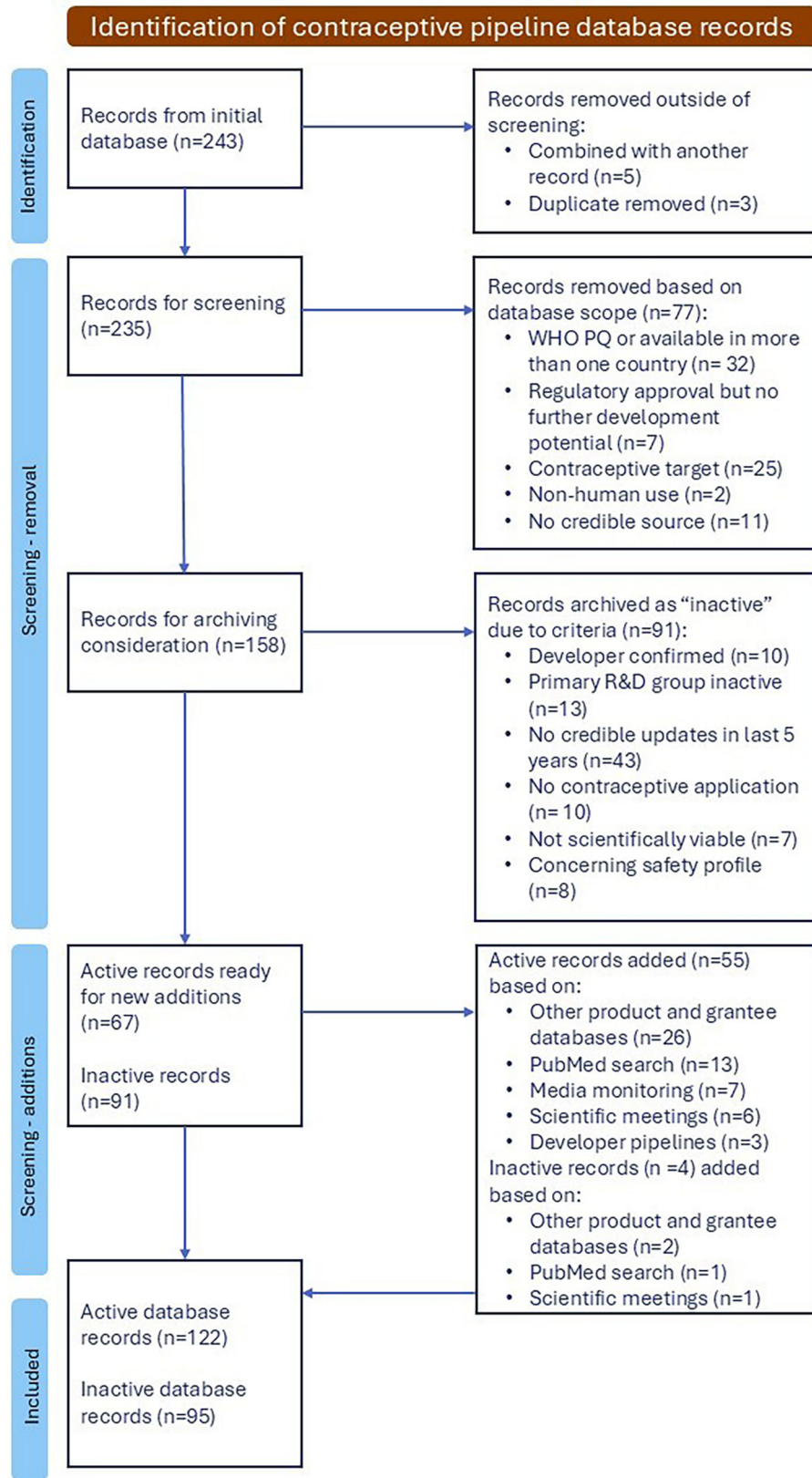


Figure 4. CTI tracker review flow diagram.

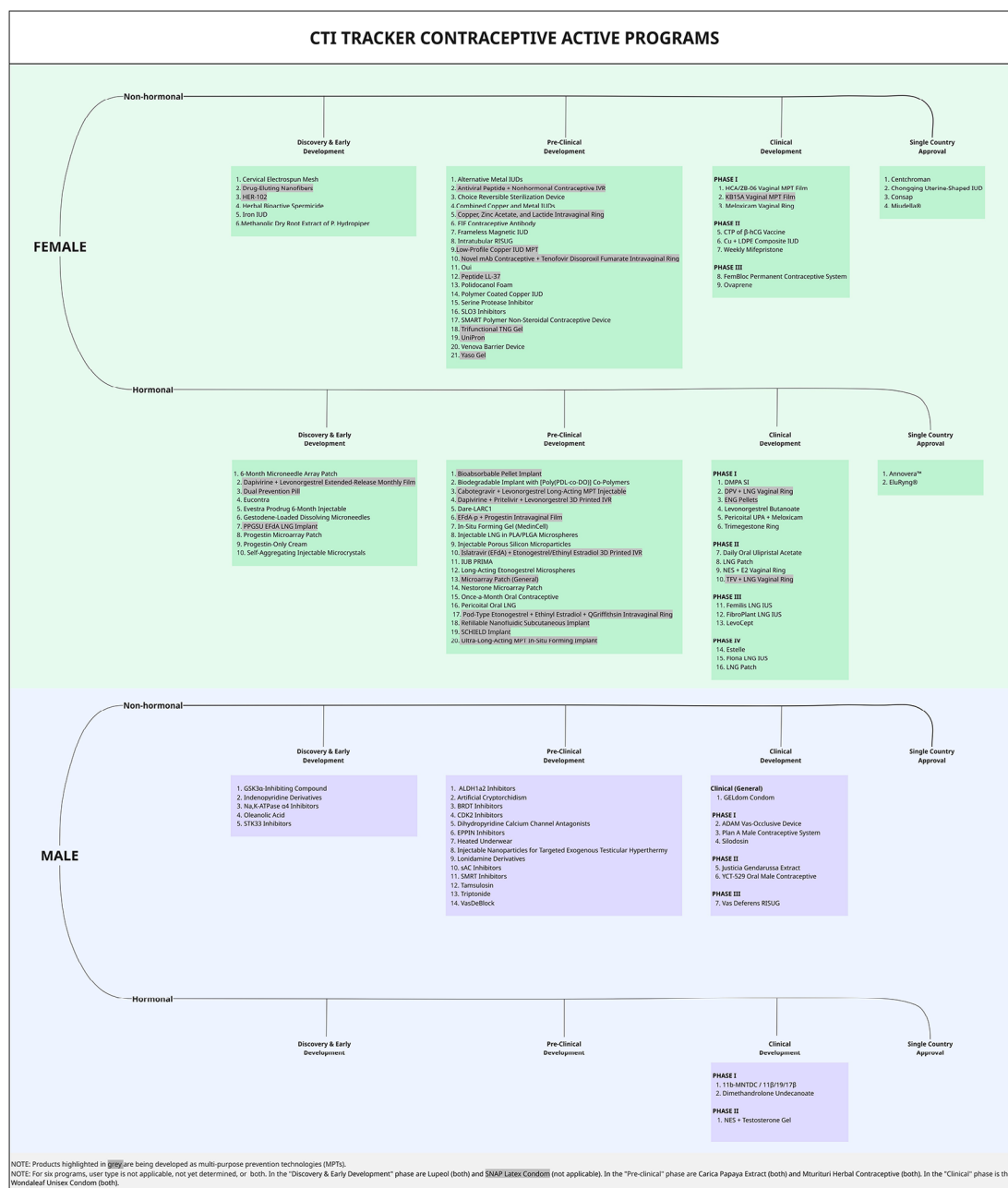


Figure 5. CTI tracker active programs summary.

certain level of volatility is necessary in this field because as products progress into different stages of development, diverse skillsets and teams are needed. At the same time, the emergence of small, women's health-focused pharmaceutical companies has contributed to a more diverse and mission-driven innovation ecosystem, signaling a shift toward more targeted and user-centered approaches to women's health, including some contraceptive development.

As illustrated in Figure 6, several products have progressed through the development pipeline, though overall movement remains limited. During this period, three methods advanced from early or pre-clinical stages into clinical trials: 11β-MNTDC, YCT-529 Oral Male Contraceptive, and the Plan A Male Contraceptive System. Two products moved from Phase I to later-stage trials (Phase III or IV): the FemBloc Permanent Contraceptive System and a lower-dose formulation of DMPA. Only one new method, Miudella[®], reached the market. Despite the urgent global need for expanded contraceptive options, these figures underscore the slow pace of product development. While this is partly due

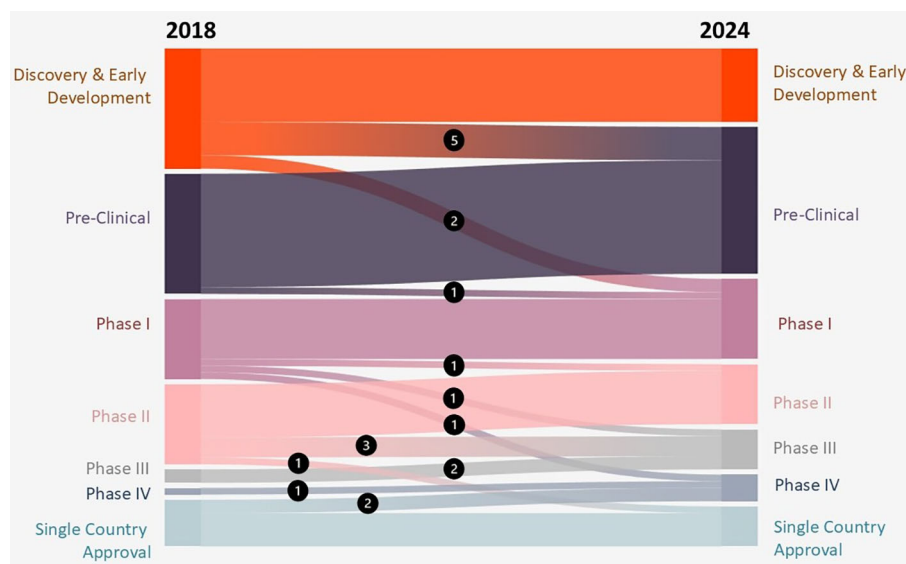


Figure 6. Progression of contraceptive products through development. *Note:* Numbers are provided where there were 5 products or less that shifted between stages.

to the scientific and regulatory complexity of contraceptive R&D, it is more fundamentally driven by chronic underinvestment, which continues to constrain innovation and leave critical gaps in the product landscape ([Impact Global Health, 2025](#)).

Discussion

Developing a global database of contraceptive products and leads required careful methodological consideration to balance scientific rigor with the realities of a dynamic and often opaque innovation landscape. One of the central challenges was navigating the inherent tension between the fluid nature of product development and the need for structured, static definitions. Programs often shift or cycle between development stages or categories, particularly in early phases, making it difficult to determine when a concept becomes a defined contraceptive lead or enters IND-enabling research. Recognizing this, we made deliberate categorization decisions while maintaining flexibility through ongoing dialogue with developers and expert advisors. This iterative approach allows the database to evolve alongside the science it represents.

Another challenge was reconciling differing perspectives on product characteristics, particularly around duration. For example, male and female methods are often conceptualized differently by developers — some focus on time to efficacy, while others emphasize dosage intervals. To ensure consistency and usability, we adopted a definition of duration based on dosage interval (e.g., long-acting methods require administration once per year or less frequently, and short-acting require administration more frequently than once per year), which we believe better serves the needs of funders, policymakers, advocates, and end-users.

Determining when a product is no longer scientifically viable also poses difficulties. While some developers explicitly communicated discontinuation, either directly to the CTI Exchange editorial team or through publication, scientific progress is rarely linear or final. To preserve transparency and institutional memory, we chose to retain these records in an archived section of the database. However, we acknowledge that this archive is inherently incomplete, as product failures are often underreported or not publicly documented.

By embracing the complexity of contraceptive R&D and prioritizing transparency, adaptability, and collaboration, the CTI Tracker aims to be a living resource that reflects the dynamic landscape of contraceptive innovation. Looking ahead, the CTI Tracker is positioned to serve not only as a reflection of current progress but as a catalyst for future innovation. By equipping stakeholders with timely, organized, and actionable insights, it can help drive more strategic investments, foster meaningful collaborations, and inspire the next generation of contraceptive researchers. Ongoing engagement and support for this resource are critical to maintaining its momentum, ensuring it remains current and high-quality, and strengthening the overall contraceptive development ecosystem.

Data availability statement

All data used in this analysis are publicly available through the Contraceptive Technology Innovation Exchange Tracker, accessible at: <https://www.ctiexchange.org/cti-tracker> and an excel version of the database is available upon request. Please contact admin@ctiexchange.org.

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