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**HYSTERECTOMY: ETIOLOGY MAIN INDICATIONS AND CAUSATIVE FACTORS
AND EPIDEMIOLOGY**

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Abstract: Hysterectomy (surgical removal of the uterus) is among the most common major gynecologic procedures, performed for benign indications (uterine leiomyomas, abnormal uterine bleeding, adenomyosis, endometriosis, pelvic organ prolapse), premalignant lesions, malignancies, and-rarely-life-threatening obstetric emergencies (emergency peripartum hysterectomy). This review summarizes key etiologic drivers and risk factors, and synthesizes epidemiologic patterns, including population prevalence, regional and socio-demographic disparities, time trends, and the increasing uptake of minimally invasive hysterectomy. In the United States, the crude prevalence of



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hysterectomy among women aged ≥ 18 years was estimated at $\sim 17.2\%$ in 2021, with variations by education, income, disability status, and region.

Keywords: hysterectomy; etiology; epidemiology; uterine fibroids; abnormal uterine bleeding; adenomyosis; endometriosis; pelvic organ prolapse; peripartum hysterectomy; minimally invasive surgery.

INTRODUCTION: Hysterectomy refers to surgical removal of the uterus, performed as a partial (subtotal/supracervical) or complete (total) procedure, and in certain cases as an extended (radical) operation. In clinical practice, the extent of surgery depends on the nature of the disease, the spread of the pathologic process, reproductive plans, and the response to alternative treatment options. In benign gynecology, hysterectomy is often viewed as a definitive treatment because it removes the organ that constitutes the primary source of symptoms; in oncology, it may represent a key component of the anti-tumor surgical stage. At the population level, hysterectomy is also important because it influences women’s health statistics (for example, defining the “at-risk population” in cervical cancer estimates) and affects the allocation of health-system resources. From an epidemiologic standpoint, hysterectomy frequency varies markedly across countries, regions, and social groups. In AQSh, 2021 data indicate that approximately 17.2% (crude) of women aged ≥ 18 years had undergone hysterectomy, and this proportion differs by education level, income, urbanization, and region. The literature also notes that roughly 600,000 hysterectomies are performed annually in the United States, although methodological differences may yield lower or higher estimates. In many countries, rates of hysterectomy for benign indications have been decreasing, while the share of minimally invasive techniques (laparoscopic/robotic) has been increasing. The aims of this article are to: (1) explain the leading etiologic drivers of hysterectomy from clinical–morphologic and risk-factor perspectives; (2) synthesize key epidemiologic indicators and global/regional disparities; and (3) discuss time trends, the potential risk of “overuse,” and alternative treatment options.

METHODOLOGY: This work was conducted as a narrative review. Evidence was synthesized from openly available clinical guidelines, national statistical reports, and recent scientific articles (approximately 2015–2025). Data were organized in three domains: (a) indications and etiology (benign, oncologic, and obstetric emergency settings); (b) population burden (prevalence), surgical frequency (incidence or procedure rates), and inter-regional differences; and (c) temporal trends and surgical route (abdominal, vaginal, laparoscopic/robotic). Priority was given to higher-reliability sources (professional society recommendations, official statistics, meta-analyses, and large population-based studies).

RESULTS

1. Etiology and main indications. In benign gynecology, the most common indications for hysterectomy often partially overlap: symptomatic uterine leiomyomas (fibroids), abnormal uterine bleeding (AUB), adenomyosis, endometriosis, pelvic organ prolapse, and premalignant changes of the cervix/endometrium. In routine practice, fibroids and AUB are frequently reported as leading indications; documents from ACOG also note a high contribution of fibroids and AUB among benign hysterectomy indications. European data likewise describe frequent occurrence of fibroids, prolapse, menstrual disorders, endometriosis, and premalignant conditions.

Leiomyoma (fibroid) etiology is multifactorial: genetic predisposition, sensitivity to estrogen–progesterone signaling pathways, local growth factors, and extracellular matrix remodeling all contribute to fibroid growth. Tòychiyev Hakim: Clinically, if fibroid-related symptoms (heavy menstrual bleeding, pain, urinary dysfunction, impact on fertility) worsen and medical therapy or uterus-sparing surgery (myomectomy) is insufficient, hysterectomy may be considered. Prevalence estimates for fibroids vary widely depending on diagnostic methods (asymptomatic cases are common), making accurate assessment of the baseline disease burden epidemiologically important.



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Abnormal uterine bleeding (AUB) is another major pathway leading to hysterectomy. Under the “PALM–COEIN” framework, AUB is classified into structural causes (polyp, adenomyosis, leiomyoma, malignancy/hyperplasia) and non-structural causes (coagulopathy, ovulatory dysfunction, endometrial causes, iatrogenic, and not otherwise classified). When the etiology cannot be clarified or conservative management (hormonal therapy, LNG-IUS, endometrial ablation, hysteroscopic resection) fails—especially in the presence of anemia and a marked decline in quality of life—hysterectomy may be selected as a definitive solution. In this respect, accurate etiologic diagnosis is one of the most critical practical levers for reducing hysterectomy rates. Adenomyosis (endometrial glands and stroma within the myometrium) is typically symptomatic between ages 35–50 and often presents with dysmenorrhea and heavy menstrual bleeding. Proposed etiologic contributors include disruption of the endometrial–myometrial junction, childbirth, intrauterine procedures, inflammation, and hormonal factors. Endometriosis is a chronic condition with a prominent immune–inflammatory component; it is explained through retrograde menstruation theory, metaplasia, and genetic/epigenetic factors, and commonly presents with pain syndromes and infertility. Although endometriosis is frequently managed with uterus-sparing surgery and pharmacotherapy, the likelihood of hysterectomy increases in severe, recurrent cases or when multiple pathologies co-exist (e.g., adenomyosis + fibroids + AUB).

Pelvic organ prolapse (POP) also has a multifactorial etiology: vaginal delivery, multiparity, connective tissue weakness, age, obesity, chronic cough or other conditions that raise intra-abdominal pressure, and heavy physical labor all increase POP risk. Although uterus-preserving reconstructive procedures are possible at certain stages, in symptomatic and recurrent cases the choice between vaginal hysterectomy and uterus-preserving fixation procedures is individualized.

In oncologic indications, the etiologic context is shaped by the drivers of malignant disease: for cervical cancer, HPV infection and screening coverage; for endometrial cancer, obesity, metabolic syndrome, and prolonged estrogen exposure; for ovarian/tubal malignancies, genetic risk (e.g., BRCA) and related factors. In these settings, hysterectomy is often central to staging and radical treatment.

In obstetrics, emergency peripartum hysterectomy has a distinct etiology: it is uncommon, but performed in massive hemorrhage and life-threatening situations. Meta-analyses estimate an average frequency of approximately 1.1 per 1,000 births, with differences between low- and high-income countries. In some regional analyses (e.g., parts of Afrika), higher incidence has been reported, and key causes include uterine rupture, uterine atony, and the placenta accreta spectrum.

2. Epidemiology: burden, disparities, and trends. Population prevalence reflects the proportion of women who have undergone hysterectomy at any point in their lives. In U.S. NHIS / NCHS data for 2021, the crude prevalence among women aged ≥ 18 years was 17.2%, while the age-adjusted estimate was 14.6%; differences were also reported by education, income, disability status, and region. These figures indicate that hysterectomy remains widely performed and simultaneously raise questions, in an equity framework, about which groups are more likely to undergo the procedure.

Annual procedure counts also vary across sources: reviews commonly cite approximately 600,000 hysterectomies per year in the United States. Such variability can be explained by differences in capturing inpatient versus outpatient surgeries, coding practices, insurance/registry coverage, and study design. Therefore, for epidemiologic inference, documenting methodology and comparing trends is typically more informative than relying on a single headline number.

Cross-country comparisons consistently show substantial variation in hysterectomy rates. Some European observations note lower procedure rates for benign indications and emphasize within-country regional variation (for instance, studies analyzing cantonal variation in Shveysariya). In Shveysariya, a 2015 estimate reported a hysterectomy rate of about 167 per 100,000 women, which has been considered relatively low compared with certain other European settings.



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Time trends suggest that, across many regions, hysterectomy for benign indications has been declining. In Daniya, conclusions drawn from 2000–2015 data report decreasing age-standardized hysterectomy rates, largely attributable to reductions in benign hysterectomy. In Germaniya, analyses spanning 2005–2019 also describe an overall decline with subtype-specific shifts.

The surgical route is changing as well. Minimally invasive hysterectomy (MIS: laparoscopic/robotic) is increasing in many systems; for example, data from Yaponiya (2014–2020) report a marked rise, with MIS exceeding 50% in many contexts from 2019 onward. This trend is often explained by reduced surgical trauma, shorter recovery, and decreased length of hospital stay, while also highlighting challenges related to workforce training and technology access.

In low- and middle-income settings, the epidemiologic picture can differ: limited availability of conservative therapies and endoscopic services, delays in diagnosis, and higher burdens of anemia and inflammatory complications may contribute to later-stage pathways to hysterectomy. In Hindiston, analyses based on NFHS-5 (2019–2021) estimate that about 3.3% of women aged 15–49 had undergone hysterectomy, with substantial state-level variation (e.g., higher estimates in regions such as Andhra Pradesh and Telangana). These findings suggest that, beyond etiologic drivers, access to health services, the role of the private sector, socio-economic pressures, and variability in clinical decision-making also shape hysterectomy epidemiology.

DISCUSSION

The main “bridge” linking etiology and epidemiology is the clinical care pathway and the availability of alternative (uterus-sparing) treatments. Because conditions such as uterine fibroids and abnormal uterine bleeding (AUB) are highly prevalent and because fibroid prevalence estimates vary widely depending on diagnostic methods—the major “mass” in hysterectomy epidemiology largely accumulates through benign pathology. If, at the primary-care or first-contact level, the etiology of AUB is not fully evaluated according to the PALM–COEIN system, anemia is not corrected in a timely manner, or minimally invasive/organ-preserving interventions are unavailable, the share of hysterectomy can increase in a “system-driven” way. Conversely, expanding screening, early diagnosis, and conservative treatment is highly likely to reduce benign hysterectomy rates; the downward trends observed in countries such as Denmark and Germany can be interpreted as signals consistent with this trajectory.

CONCLUSION

The etiology of hysterectomy (i.e., the core clinical reasons that lead to performing the operation) can be grouped into two major categories: (1) benign gynecologic disorders (symptomatic uterine leiomyomas, abnormal uterine bleeding, adenomyosis, endometriosis, pelvic organ prolapse, and certain premalignant conditions); and (2) oncologic processes (situations requiring surgical treatment in endometrial cancer, cervical cancer, and other malignancies of the reproductive system). A third category—rare, but clinically the most severe—is obstetric emergency (peripartum) hysterectomy, typically undertaken for life-threatening hemorrhage, placenta accreta spectrum, uterine atony, or uterine rupture. The epidemiologic profile demonstrates that hysterectomy is distributed very unevenly across countries and regions, and that rates vary due to socio-demographic factors (age, income, education, access to care) as well as differences in “indication standards” within clinical practice. In recent years, the overarching trend has been a reduction in hysterectomy performed for benign indications and an increase in the proportion of minimally invasive approaches (laparoscopic/robotic and vaginal routes). From the perspective of dissertation (OAK) requirements, the practical value of the topic is strengthened by: clearly classifying hysterectomy indications (e.g., PALM–COEIN for AUB and staging/grading for POP), fully documenting uterus-sparing treatment options, standardizing criteria for selecting the surgical route, and implementing registry-audit systems to continuously monitor regional variation and complications.



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