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Gynaecological research in China

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Foreword

Gynecological conditions represent a persistent global health challenge, significantly impacting millions of women across all ages and demographics. While recent data from The Lancet (2020)ⁱ indicated a slight decline in overall prevalence, these conditions still rank among the top ten disorders affecting women aged 10 to 49 worldwide, disproportionately affecting low- and middle-income countries, with the most rapid increase in disease burden among women aged 20–24.

The research documented here shows how Professor Lan Zhu, a leading researcher from China is an important contributor to research into gynaecological conditions and innovations with an ever-growing influence in international health guidelines and policies. It also underscores the critical role of institutions such as Peking Union Medical College Hospital (PUMCH), for which Professor Zhu leads on the Gynaecology and Obstetrics department.

This report not only celebrates China's achievements in advancing gynecological diagnosis and treatment and improving the quality of life of women, but also serves as a call to action: to sustain investment in research, foster international partnerships, and prioritise the translation of scientific discoveries into real-world health improvements.

Summary

This report examines the global impact of gynecological research, in particular the areas of urinary incontinence, pelvic organ prolapse, Herlyn-Werner-Wunderlich syndrome, mesh related surgical repair and myomectomy and related tumors, by Professor Zhu and originating from China. When referring to global impact, this report looks at the far-reaching significance and demonstrable benefits to healthcare professionals, healthcare systems, and scientific understanding worldwide, translating academic insights into tangible improvements that transcend geographical boundaries. Here, Professor Zhu is recognised as a key contributor to international research in the specific areas outlined, their diagnosis, treatment and management. Furthermore, this document highlights her contribution to shaping evidence-based clinical practice, and the influence this has on international policy, and improving health outcomes globally.

Key findings include:

- ◆ Professor Zhu's publication in high-impact international journals and a corresponding growth in citations within global clinical guidelines and policy documents.
- ◆ The role of Peking Union Medical College Hospital (PUMCH) as a leading institution and the contribution of Professor Zhu whose work has shaped both national and international gynaecological care strategies.
- ◆ Evidence that Chinese gynecological research is increasingly cited by major organisations such as the National Institute for Health and Care Excellence (NICE), Haute Autorité de Santé (HAS), AWMF Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften (AWMF), and Deutsche Gesellschaft für Gynäkologie und Geburtshilfe e.V. (DGGG), reflecting its broad global reach and relevance.
- ◆ The report concludes that continued investment in research and international collaboration, is critical to sustaining and building on this progress. China's experience demonstrates how research excellence, when effectively translated into practice, can significantly improve population health outcomes both domestically and globally.

Global Burden of Gynecological Health

Gynecological diseases remain a significant global health burden, affecting millions of women across diverse populations and age groups. While the most recent Global Burden of Disease study reported a slight decline in the overall prevalence of gynecological conditions, they still ranked among the top ten disorders affecting women aged 10 to 49 worldwide, particularly in low- and middle-income countries (Lancet 2020ⁱⁱ). Notably, the most rapid increase in disease burden was observed among women aged 20–24, primarily driven by polycystic ovary syndrome (PCOS) and other benign gynecological conditions (2024ⁱⁱⁱ).

Among these conditions, female urinary incontinence stands out as a major contributor to reduced quality of life, with profound impacts on women's health, mental wellbeing, and daily functioning. A nationally representative study in 2021 estimated that approximately 85.8 million adult women in China were living with urinary incontinence (2024)^{iv}. Another life limiting gynecological disease is cervical cancer, which continues to pose a serious global threat to women's health. According to the World Health Organisation, over 350,000 women died from cervical cancer in 2022, with 94% of these deaths occurring in low-resource settings (WHO, 2022)^v. These disparities highlight the urgent need for enhanced prevention efforts, early diagnosis, and equitable access to gynecological care worldwide.

Improving the quality of gynecological services can significantly enhance health outcomes, fertility, and quality of life. In China, a nationwide study is currently underway across 31 provinces, to better understand care disparities and identify opportunities for improvement. This two-year project aims to “develop a framework for evaluating gynecological care quality in China, analysing disparities and proposing improvement strategies” (2025^{vi}). Studies of this scale are not only vital for improving health outcomes within China but also carry significant global relevance. They offer valuable insights into how large, diverse populations experience and manage gynecological disease, which in turn informs international standards, health policy, and care delivery. The work of Professor Lan Zhu clearly illustrates this global significance, as her contributions have helped translate national findings into actionable frameworks for improving gynecological health worldwide. Such research fosters international collaboration, supports global benchmarking, and ensures that lessons learned in China can benefit women's health on a global scale.

Peking Union Medical College Hospital (PUMCH) and the department of Obstetrics and Gynecology

Peking Union Medical College Hospital (PUMCH) is a Class A tertiary comprehensive hospital in China, with a commitment to cutting-edge clinical care, innovative scientific research, and rigorous medical education. Founded by the Rockefeller Foundation in 1921 with the vision of becoming the "best Medical Center in Asia," PUMCH has consistently upheld its core spirit of "preciseness, ever-improving, diligence, and devotion" and the aspiration of "practicing medicine for the country and the people and assiduously learning in pursuit of knowledge" for over a century.

Recognised by the National Health Commission, PUMCH serves as a national guiding center for diagnosing and treating complex and severe disorders, a demonstration center for higher medical education and standardised residency training, and a core national base for clinical research and technological innovation. It also holds the distinction of being one of China's earliest hospitals to provide care for senior leaders and international patients. PUMCH consistently ranks No. 1 in the National Tertiary Public Hospital Performance Evaluation, a testament to its broad range of disciplines, advanced technologies, and exceptional specialties. Beyond its clinical duties, PUMCH actively fulfills its social responsibility by providing medical services and support to underdeveloped and remote areas, as well as during emergencies and major national events. Consistently guided by patient needs, PUMCH is committed to delivering the highest quality services, underpinned by unwavering faith, professional ethics, dedicated contribution, and a rigorous academic approach.

The Department of Obstetrics and Gynecology at Peking Union Medical College Hospital (PUMCH) is a nationally recognised leader and key discipline, designated by the Ministry of Education and the Ministry of Public Health. It also houses the prestigious Lin Qiaozhi Research Center for Obstetrics and Gynecology and consistently achieves the top national ranking among its peers. The department possesses a solid research foundation across various crucial areas, including:

- ◆ Endometriosis
- ◆ Gynecological cancer
- ◆ Prenatal genetic diagnosis
- ◆ Sexual development disorders
- ◆ Pelvic floor disorders
- ◆ Menopause-related diseases

The department has successfully undertaken numerous national key projects, yielding significant achievements:

- ◆ **Endometriosis:** Comprehensive basic and clinical research in endometriosis led to the proposal of the "3 A" theory and a novel understanding of in situ endometrium determinism in disease onset. This work, which also included the development of a clinical guideline and diagnosis and treatment strategy, was honored with a second-class national award for progress in science and technology.
- ◆ **Ovarian Cancer:** Over 20 years of profound clinical and basic research in ovarian cancer also garnered a second prize of national science and technology progress.
- ◆ **Chorionic Carcinoma:** Radical treatment of chorionic carcinoma holds a leading status both in China and abroad, recognised with the Gold Cup award in the national technology exhibition and a first-class award for science and technology progress from the Ministry of Public Health.
- ◆ **Prenatal Diagnosis:** PUMCH established the first prenatal diagnosis and research group and laboratory in mainland China. Extensive work in this field earned a second-class national award for progress in science and technology.
- ◆ **Sexual Development Disorders:** Profound clinical and basic research on sexual development disorders resulted in a new classification method, which received the first prize of science and technology progress from the Ministry of Public Health and the third prize of the national science and technology progress award.
- ◆ **Female Pelvic Floor Functional Disorders:** Comprehensive basic and clinical research has produced significant academic results and patents in this field.
- ◆ **Gynecological Laparoscopy:** This department was the first to introduce gynecological laparoscopy into mainland China, spearheading the promotion of laparoscopy for complex cases, establishing the Chinese Gynecological Laparoscopy Association within the Chinese Society of OBGYN, CMA, developing qualification access standards for laparoscopy physicians, and creating guidelines for laparoscopic technology operation.
- ◆ **Cervical Lesion Screening:** Successfully established and promoted a cervical lesion screening system, advancing the "three-step" diagnostic and treatment process and completing a national promotion project.
- ◆ **Menopause Management:** Pioneering clinical and basic research on menopause-related diseases began at PUMCH, leading to the development of a clinical diagnosis and treatment model. This work led to the establishment of the Chinese Menopause Association within the Chinese Society of OBGYN, CMA, and the composition of a guideline for menopause management.
- ◆ **Assisted Reproduction Technology (ART):** The IVF center has achieved a leading frozen embryo transfer pregnancy rate both domestically and internationally, reflecting detailed and advanced work in ART.

Profile of Professor Lan Zhu

Background

Professor Lan Zhu is the director of the Obstetrics and Gynaecology department at Peking Union Medical College Hospital (PUMCH), where she combines surgical innovation, large-scale epidemiological research, and global collaboration. She is a prominent researcher and recognised leader in the field of gynecology and pelvic health: urogynecology, urinary incontinence, pelvic reconstructive surgery, and urodynamics.

Professor Zhu holds leadership positions in numerous clinical societies, for example she is the President-designate of the Chinese Society of Obstetrics and Gynecology (CMA) and President, of both the Society of Pelvic Floor Disease Prevention (CPMA) and the Society of Urogynecology & Reconstructive Pelvic Surgery Society (CMA). Professor Zhu is equally globally recognised as the Director of Pacific Rim/India/Asia region for the American Association of Gynecologic Laparoscopist (AAGL) and is a board member, overseas advisory board, for the European Society for Gynaecological Endoscopy (ESGE). She is also Deputy Chief Editor for the Chinese Journal of Obstetrics and Gynecology. In addition, Professor Zhu is a regular keynote speaker at global forums, including the BMJ International Forum in Hong Kong (Aug 2024)^{vii}. Her work often involves large-scale national studies in China, providing significant insights into the prevalence, risk factors, and management of conditions. Most recently, she has undertaken a three stage national study, across 31 states in China, looking at care quality with a view to developing a framework for evaluating gynaecological care (2025)^{viii}.

Areas of research

As illustrated by the notable positions held by Professor Zhu, her work also not only influences clinical practice in China but contributes significantly to the international medical community through research, leadership, and education. She leads and collaborates on high impact studies such as a large-scale epidemiology of urinary incontinence in Chinese women, that ran from 2006–2021 and showed a significant prevalence drop from 30.9% to 16% (2021)^{ix}. Professor Zhu's work on incontinence, pelvic organ prolapse screening, and interventions for women's pelvic health, has been published in prominent journals such as the International Journal of Gynecology and Obstetrics and the International Urogynecology Journal. As a professor she is a primary supervisor for MD and PhD candidates.



Professor Zhu has authored over 669 papers during her career, with her most recent work being a focus on the development of a polygenic risk score for pelvic organ prolapse in Chinese women (May 2025). To illustrate the global impact of aspects of some of this research, in particular; urinary incontinence, pelvic organ prolapse, Herlyn-Werner-Wunderlich syndrome, mesh related surgical repair and myomectomy and related tumors, using BMJ Impact Analytics, 32 articles have been identified and tracked to show their global impact.

Portrayal of global impact

Diagram 1 visually portrays 32 of Professor Zhu's articles published over a 19-year period, showcasing her consistent and high-standard contributions to gynecology. These contributions notably span areas such as urinary incontinence, pelvic organ prolapse, Herlyn-Werner-Wunderlich syndrome, mesh related surgical repair and myomectomy and related tumors. These 32 articles appeared in 18 distinct journals, including the Chinese Medical Journal (3 articles) and internationally recognised publications like the International Journal of Gynecology and Obstetrics (5 articles) and the International Urogynecology Journal (4 articles). The main journals of publication are recorded in **Diagram 2**.

Diagram 1 also illustrates and tracks the transition from publication to implementation, showing the number of times Professor Zhu's articles have been cited in the development of clinical guidelines and health policy documents. Between 2007 and 2024, these articles accumulated a total of 62 citations within such documents. For example, a long term randomized trial looking at comparative safety of retropubic tension-free vaginal tape and inside-out transobturator tape (2016)^x, was published in International Urogynecology Journal, providing wide exposure. This paper then went on to be cited by the European Association of Urology Guidelines on Urinary Incontinence in Adults (2020).^{xi}

A citation in a widely accessible clinical guideline significantly enhances the visibility and impact of research, transforming it from an academic insight into an actionable component of medical practice. When research is embedded in guidelines used by healthcare professionals worldwide, it directly informs clinical decision-making, supports the standardisation of care, and ultimately improves patient outcomes. Moreover, the inclusion of research in open-access guidelines ensures that low-resource settings can also benefit from evidence-based recommendations, helping to reduce global disparities in healthcare quality. Being cited in a guideline also increases a study's visibility, sustainability, and influence, reinforcing its value in shaping policy, clinical training, and future research priorities. It is also important to note that there is typically an average four-year lag between the publication of a study and its citation in policy documents, suggesting that citation numbers are likely to continue growing.

Diagram 1

Professor Lan Zhu's impact, from publication to implementation

Note: there is typically at least a 4 year delay between publication and citation

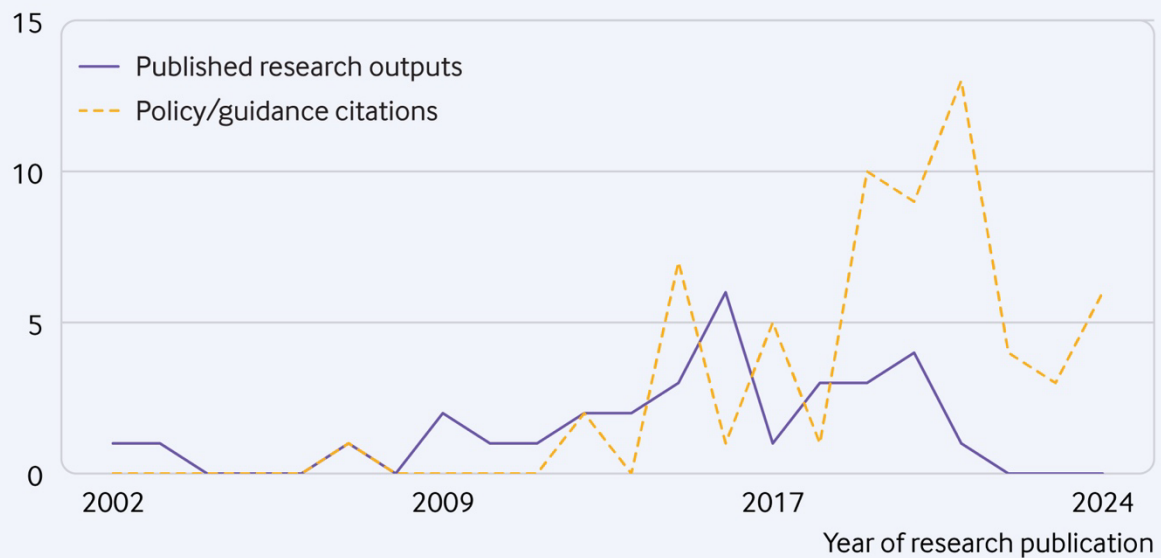
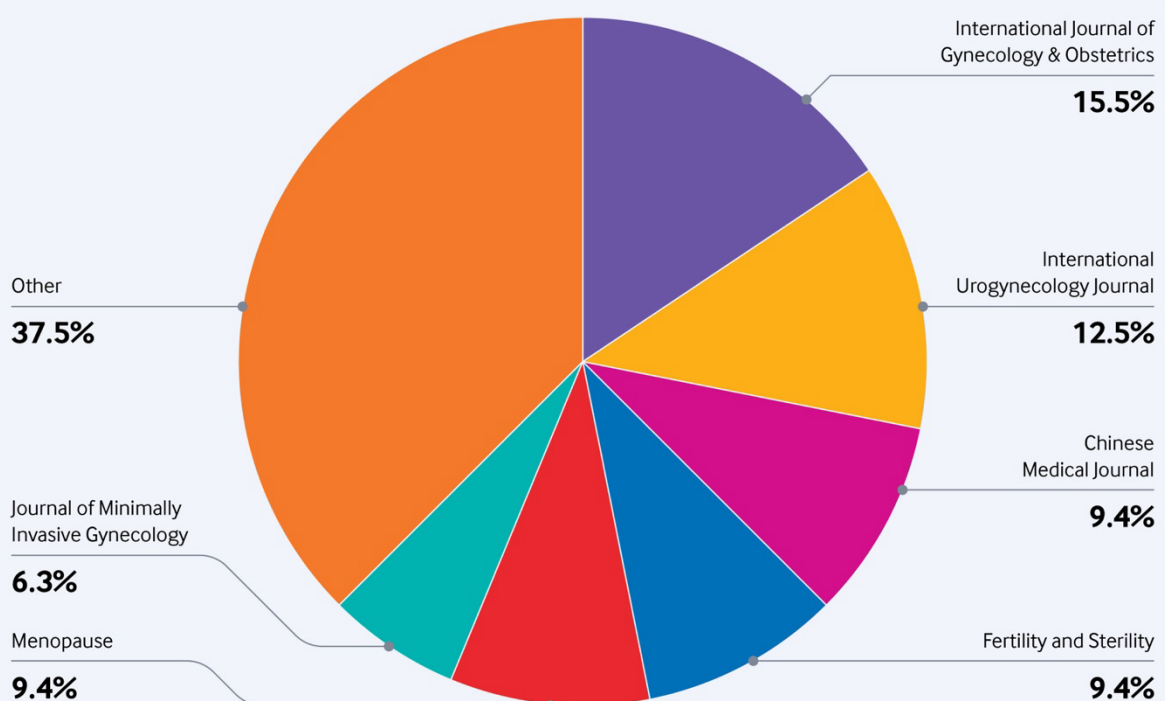


Diagram 2

Cited research outputs by journal



Policy and guidance citing Professor Zhu

Diagram 3 highlights the types of guideline or policy documents that cite Professor Zhu's work, clearly demonstrating her research's reach and impact beyond traditional academic publications. From this it is evident that 21% of citations stem from guidelines produced by the UK's National Institute for Health and Care Excellence (NICE). NICE, is an executive non-departmental public body, sponsored by the UK Department of Health and Social Care. It is renowned for developing comprehensive, evidence-based clinical guidelines for the NHS to improve health and social care; inform the diagnosis, management, and treatment of a wide range of conditions. The subsequent 31% of citations are shared among three other key organisations, all of which produce national guidelines and policies:

- ◆ Haute Autorité de Santé (HAS): The independent French National Authority for Health, responsible for ensuring the effectiveness, safety, and efficiency of the French healthcare system through scientific evaluation, quality assurance, and the promotion of best practices.
- ◆ Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften (AWMF): The Association of Scientific Medical Societies in Germany, which sets standards for medical practice and research across Germany.
- ◆ Deutsche Gesellschaft für Gynäkologie und Geburtshilfe e.V. (DGGG): The German Society of Gynecology and Obstetrics, a central organisation for gynecological and obstetrical expertise, research, and practice in Germany.

For example, a long-term randomised control trial looking at retropubic tension-free vaginal tape and inside-out transobturator tape by Zhu and colleagues (2015)^{xii} is cited by NICE in its guideline (NG^{xiii}123) covering the management of urinary incontinence and pelvic organ prolapse in women. In turn, this particular guideline has subsequently been cited 76 times globally including in Australia, New Zealand, the US and the UK, exemplifying the far reaching influence of Professor Zhu's work. Furthermore, this single article is also cited in a policy document from the Australian Government Department of Health (Review of comparative clinical and cost effectiveness to support the Prescribed List Post-Listing Review 2023^{xiv}) and the European Association of Urology Guidelines on Urinary Incontinence (2020^{xv}). Furthermore, a paper by Professor Zhu and colleagues from the International Urogynecology Journal (2010^{xvi}) was subsequently referenced by the World Health Organisation (WHO) in its China country assessment report on ageing and health^{xvii}. The widespread citation of Professor Zhu's work across guidelines and policy documents worldwide ultimately contributes to improved health outcomes on a global scale.

Diagram 4 effectively illustrates the international spread and global impact of these papers, which have been cited in health policy or guidelines across 10 countries. The United Kingdom and Germany lead with 15 and 12 citations respectively, clearly demonstrating the significant influence of this

research from China. This impact extends beyond Europe, with papers also being picked up in the United States, Canada, and Australia, with one paper being cited by the WHO and thus contributing to an even wider global reach.

Diagram 3

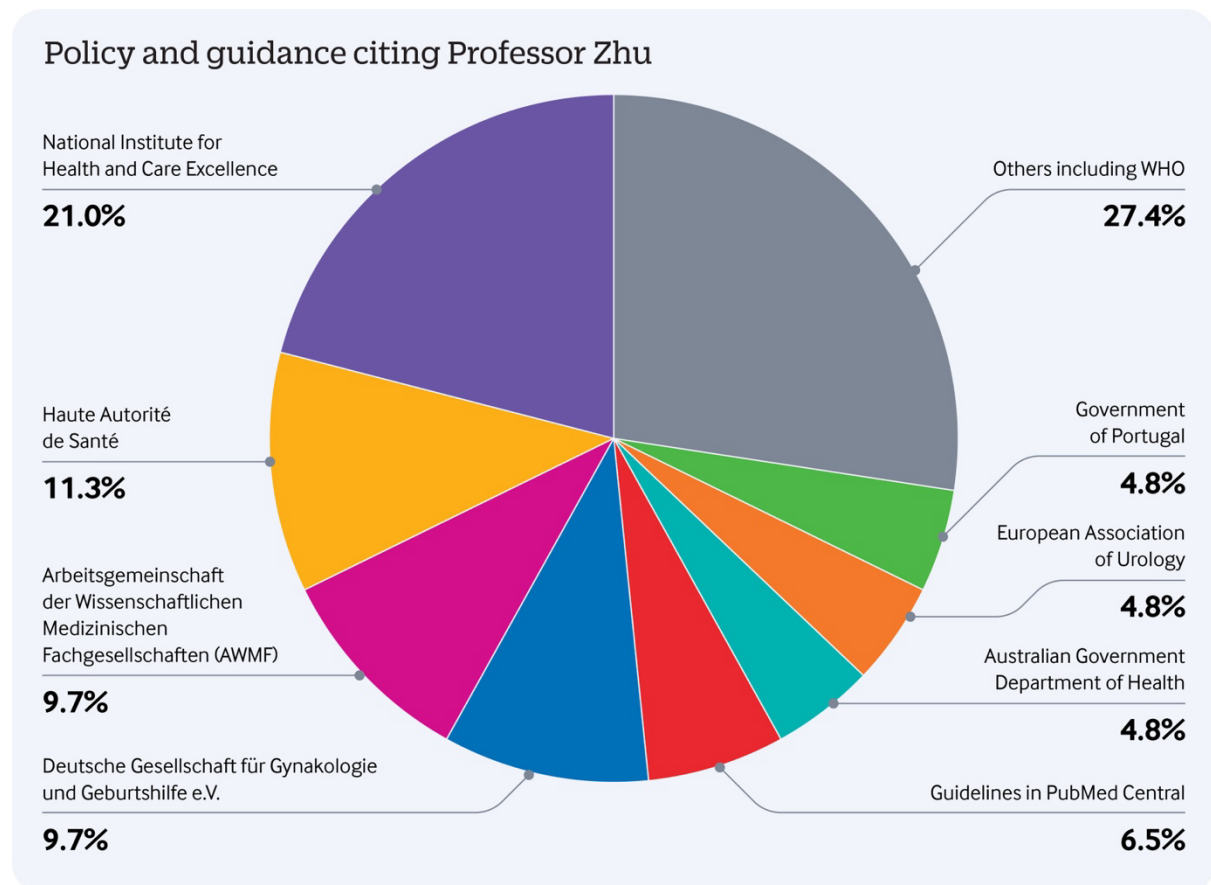
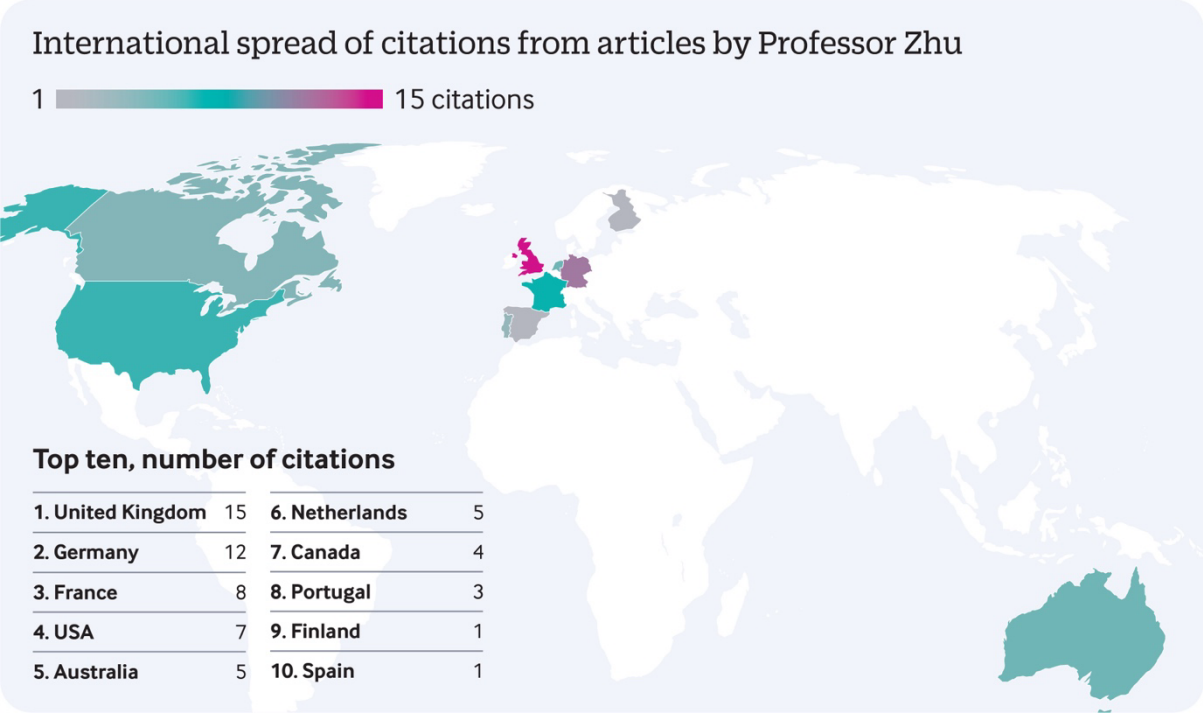


Diagram 4



Conclusion

Gynecological problems and diseases represent a critical and ongoing global health burden, impacting millions of women worldwide and demanding concerted efforts for improved care and outcomes. However as this report illustrates, China, through leaders such as Professor Lan Zhu stands as a prime example of how robust, large-scale research originating in China can yield insights with profound global implications. Her leadership at Peking Union Medical College Hospital, combined with her pivotal roles in both Chinese and international medical societies, underscores her commitment to advancing gynecological health. Professor Zhu's impressive body of work, across a 19-year period, demonstrates a consistent contribution to key areas including urogynecology, urinary incontinence, and pelvic reconstructive surgery.

Crucially, the impact of her research extends far beyond academic publication. As illustrated, her articles have been cited 62 times in clinical guidelines and health policy documents from 2007 to 2024, notably influencing bodies like NICE in the UK (21% of citations) and leading organisations in France (HAS) and Germany (AWMF, DGGG). This widespread integration into global clinical guidelines and health policy across 10 countries, including major Western nations such as the UK, Germany, the US, Canada, and Australia, transforms her research into actionable medical practice. Such direct application of evidence-based findings not only informs clinical decision-making and standardises care but also helps reduce global disparities in healthcare quality.

Professor Zhu's contributions exemplify the power of international collaboration in medical research. By translating national findings into universally applicable frameworks and fostering global benchmarking, her work ensures that advancements in China contribute directly to enhancing women's health outcomes on a global scale. Her ongoing research continues to shape future policy, clinical training, and research priorities worldwide.

Methodology

Real World Data presented in this report was collated using BMJ Impact Analytics, an innovative tool developed by BMJ, in collaboration with Overton, which tracks the real-world impact of medical and health research. Traditional citation analysis measures where research has been cited by other research, thereby assessing its contribution to academic scholarship. BMJ Impact Analytics, identifies where research has been cited in clinical guidance and health policy documents, providing a more direct measure of its influence on healthcare practice.

For the sections of this report analysing Professor Zhu's research impact, the following search was performed in BMJ Impact Analytics: Author = Lan Zhu. There were two relevant matches (out of 21 results), based on the PUMCH affiliation and the subject areas of the associated cited outputs. Together, these two matches returned 32 research outputs which have been cited in clinical guidance and health policy documents. BMJ Impact Analytics was used to export detailed information about these research outputs, including the number and nature of these citations.

This data has been used to inform both the text and the accompanying diagrams throughout the report. Diagrams were generated based on extracted citation metrics, institutional outputs, author contributions, and international guideline citations. The integration of findings ensures that the report reflects not only the volume of research output but also its practical influence on clinical guidelines and policies worldwide.

All data was carefully verified against original publications and official databases, and citations were included according to Vancouver referencing style to maintain academic rigor and transparency.

For information regarding PUMCH, the global burden of gynecological health and the most recent publication of Professor Zhu a web search was performed.

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