A Portrait of the Pharmacy Profession Globally: Pharmacist Universal Professional Identity and Establishment of Global Pharmacy Council

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Highlights
- Professional identity is an important component of practice change.
- Research on professional identity in pharmacy is limited, and this needs to change if we are to truly move practice in the 21st century.
- A unified professional identity is crucial for society to see pharmacists as healthcare providers.

Abstract
The roles of pharmacists are transforming throughout history and modern pharmacist has a crucial role in ensuring the efficacy and safety of applied drugs. It is a wonder that the pharmacy profession is still being viewed through an antiquated lens that is inconsistent with the diversity and extent of pharmacists’ current scope of practice. There is still much debate in the academic as well as the policy literature about the role of pharmacists and their unique contribution to healthcare. However, pharmacists have been variously characterized as makers of medicines, as pill pushers, pill counters, and bottle labelers, as managers, and as entrepreneurs. Given this variety of roles, the ‘professional identity’ of pharmacists could be viewed as problematic or confused. Having a clear professional identity provides a sense of worth, belonging, or purpose for the individual as well as the group and if that identity is unambiguous then the profession also becomes clearer and more focused. Thus, the purpose of this article was to provide an idea of the universal professional identity of pharmacists as healthcare practitioners’ under the Global Pharmacy Council (GPC). This GPC will enhance the impact of the profession of pharmacy on people’s lives in the context of healthcare trends.

Keywords: Pharmacist, universal professional identity, Global Pharmacy Council

Introduction
Globally, the healthcare system is currently undergoing a major transformation after coronavirus disease in 2019 (COVID19), and pharmacists are playing a major role in this transformation as they can assume more responsibilities in providing healthcare services to their consumers \cite{1-4}. Pharmacists are recognized as the most accessible healthcare settings due to the high volume of people who use their services. Hence, pharmacists are well-positioned to help improve and promote health, educate patients about their diseases, advise on minor ailments, provide information about the appropriate use of medications and potential side effects, encourage adherence, and identify, resolve, and prevent drug therapy problems in collaboration with other health care providers \cite{5-8}. There is substantial evidence to support the benefits of pharmacist care for patient clinical outcomes and healthcare costs \cite{9,10}. Studies by George and Tsuuki et al., have documented that the engagement of pharmacists with an extended scope of practice has significant public health implications \cite{11,12}.

When you ask the public what a pharmacist does, most people say, “Dispenses medication”. The public image of pharmacists is often identified as shopkeepers rather than medication experts caring for patients. While people buy prescriptions at retail pharmacies, pharmacists do much more than sell drugs. Pharmacists in a retail outlet field numerous questions every day from patients and other health care providers. These questions encompass drug side effects, therapeutic alternatives when certain drugs are not available or prohibited due to allergies or disease contraindications, and recommendations for over-the-counter (OTC) drugs for minor ailments. Pharmacists are constantly evaluating patient drug histories for the drug to drug or drug to disease interactions. This is done for each prescription filled by the pharmacist. Pharmacists also monitor adherence and compliance by patients. Pharmacists provide medication management services that analyze and optimize patient medication regimens. Many pharmacists are also immunizers that administer vaccines. In addition, they may also perform health tests that include blood pressure (BP) checks, cholesterol tests, glucose testing, as well as body mass index (BMI) testing \cite{13-19}. This description is only a portion of what pharmacists working in retail may do on a typical day. The primary duties of the pharmacists in the hospital setting include providing drug...
information, medicines management, preparation and dispensing of medicines, counseling of patients, and formulating pharmaceutical care plans for patients [20].

Recent research suggests that pharmacists have a professional identity crisis [21]. The professional identity of pharmacists has been investigated by various researchers [22, 23]. Some studies have investigated pharmacists’ views of their professional group, in comparison with others, in terms of skills and personal characteristics. In one such study, pharmacists rated their profession as more empathic but less powerful than medical specialists [22]. Some studies documented that pharmacists think that doctors find them frustrating to communicate with, and, do not recognize their knowledge about the disease, feel threatened by them encroaching on their roles or look down on them as mere ‘shopkeepers’ [24]. Two studies suggested that being seen as a ‘pill counter’ was of concern to both trainee and practicing pharmacists [25, 26]. Gregory et al. [21] stated, “Without our clear understanding of who pharmacists are as a profession, our self-identity, is it any wonder that patients, physicians, and other health professionals don’t know what to make of us and our claims to be medication experts. Thus, the establishment of GPC is a real need of time. This GPC will take necessary steps to build international recognition of pharmacy, pharmacist role, policies, and value, and to influence, promote and secure acceptance of pharmacist as an important and integral part of health systems. In addition, the GPC will conduct empirical research about pharmacists and their work, to ‘focus attention on finding out just what kind of occupation pharmacy is?’

Pharmacy practice in developing countries

Pharmacy practice in the North United States (US) today is characterized by its diversity [33]. Community pharmacy in the North US is a small but important component of the overall health care system, and its recent development has been most influenced by the rapid increase in the use of prescription drugs. In the US there are only two categories of pharmaceutical: those that require a prescription from a medical practitioner, and those which may be sold anywhere, without any professional supervision. This last group may be sold in any type of store, from vending machines, by mail order, and from service stations. As in most countries, drugs such as narcotics are controlled more stringently than others. Unlike some others, such as the UK, there is no category of pharmacy only medicines, which can only be sold through registered pharmacies. Nevertheless, US independent pharmacies continue to thrive.

Pharmacy practice in developing countries

In most developing countries healthcare is a mixture of public and private provision. Pharmacists are usually small businessmen, making a living out of the sale of medicines. In developing countries urban populations tend to be wealthier than those living in the countryside. As a result, health professionals such as pharmacists tend to prefer to work in cities, and private sector healthcare tends to be concentrated in urban rather than rural areas [34]. In Ghana, for example, eighty per cent of all registered pharmacists live and work in Greater Accra. In many urban areas of developing countries retail pharmacies are numerous. Pharmacists have an important role to play in promoting safe and appropriate use of products. Characteristics of pharmacies shown to be important include ease of access, the ready availability of medicines, affordable products, and the availability of credit [34]. In many rural areas pharmacists are scarce, and pharmaceutical services are denied to these populations. For example, eighty per cent of the population of Tanzania does not have access to pharmaceutical services. Eritrea in East African, which has a population of around 3,500,000, is served by a total of just fifty-three pharmacists, a ratio of one pharmacist per 60,000 populations [35]. The number of pharmacists per 100,000 populations for a range of middle and lower income countries is shown in Table 1.

In many developing countries pharmacists play a crucial role in the procurement of pharmaceuticals. The importance of appropriate procurement practices has been emphasized by WHO’s Essential Drugs and Medicines Policy Department, which has shown that some developing countries routinely pay 150 percent to 250 percent of world market prices for essential drugs [36]. With their specialist knowledge, pharmacists are in an excellent position to ensure that the most cost-effective drugs are bought in the most appropriate quantities from reputable suppliers and that they are delivered where and when they are required. By arranging purchases at the lowest possible total cost, making use of generic rather than branded products where appropriate, they can help to ensure that as many people as possible benefit from the limited resources available.

Variability in pharmacy practice around the world

Pharmacy practice models and practices differ in various countries. The interpretation of pharmacy practices within different countries with professional and healthcare delivery systems has not been widely examined. For example, Spanish pharmacists have defined 6 drug-related problems to use in providing care to their patients, while US pharmacists may use up to 9 drug-related problems [27]. In Australia, some pharmacies have a forward practice model where pharmacists are in front of the typical counter in a community pharmacy and meet with patients, whereas in Canada and the US, pharmacists are typically found behind the counter [28]. In the UK, pharmacists have roles in primary care teams [29]. In the US, Medicare laws effective in 2006 outline medication therapy management services for older Americans, but the role of pharmacists remains unclear [30]. Thus, each country has perspectives of pharmaceutical care and pharmacy practice that impact the implementation and practice model of pharmaceutical care. In Australia, for example, pharmacists remain the sole owners of pharmacies and are reimbursed for several types of cognitive services such as consumer drug information, residential care medication reviews, and home medicine reviews [31]. In Portugal, community pharmacists have recently obtained reimbursement for diabetes disease management [32]. In the US, and in most of Canada and Europe, there is no consistent source of reimbursement for pharmacists’ care services.
for the acquisition of medicines. Poor people spend a higher proportion of their income on drugs than do other groups. In promoting rational drug use by giving appropriate advice, pharmacists are able to reduce purchases of unnecessary and inappropriate products. There has however, been criticism in the past of pharmacists and their staff, both trained and untrained, for selling pharmaceuticals without questioning or advising clients on the suitability of particular products. There is still some way to go before the practice of the best becomes the practice of the majority.

Country wise standards for pharmacist professionalism
The 2014 global continuing professional development in pharmacy survey was conducted between January 2014 and May 2014[37]. International Pharmaceutical Federation (FIP) member organizations, country and territory level contacts from regulatory, professional and government agencies, were approached for responses to a survey asking for quantitative and multiple-choice responses concerned with continuing professional development, education and registration/licensing processes. National demographic and economic data was also collected. The survey was developed in collaboration with the FIP Collaborating Centre (University College London, School of Pharmacy) and the FIP Education Development Team. The survey tool was made available in 7 languages (Arabic, English, French, Japanese, Mandarin, Portuguese and Spanish). The dataset was quality assured and checked with respondents before being prepared for analysis. The survey tool, data tables and the report are available for download from www.fip.org/educationreports.

Thirty one countries and territories (52%) indicate a national registration examination as part of the licensing process, with The Americas and Eastern Mediterranean regions having the lowest frequencies of examination process in place. Half of the sample countries and territories responding to this question indicated that after registration, there were no further regulatory or educational requirements to maintain registration (50%). Those countries and territories with a registration examination were twice as likely to have continuing requirements in place. The types of national regulatory or licensing agencies are listed in Table 2, from which it is possible to see that regulation and licensing for the majority of countries and territories is either an independent agency or a government/ministry activity. The requirements for maintaining registration or license (for those countries and territories who do require educational maintenance of license, 33 of 62 countries and territories who responded to this question) are multiple and listed in Table 3. The majority of respondent countries and territories used a ‘credit system’ (76%) as the principal means of continuing registration; however, the use of a portfolio type system (whether in combination or a single method) was cited by a third of those with educational maintenance continuous profession development (CPD) (33.3%, 11). When this is cross tabulated with wealth and income levels, more than double the proportion of high income countries (41%) have a ‘portfolio’ as part of the CPD maintenance requirements, compared with 20% of low income countries and territories. Other categories of ways of maintaining registration provided by the sample include periodic OSCE-type assessments (objective, structured, clinical examinations), reflective diaries and records, and certification systems based on periodic attendance at national training centers[37].

Education of the pharmacist
In most countries prospective pharmacists are trained to degree standard, followed by a period of pre-registration training, typically of one year’s duration. The degree course is science based, with a strong emphasis on the pharmaceutical sciences, social and administrative pharmacy, and forensic pharmacy. These are summarised in Table 4. The exact syllabus varies substantially from country to country. In recent years the period of study has tended to become longer, and the competencies required for registration have become more rigorous. In the United Kingdom there are currently sixteen schools of pharmacy. These now offer a four-year undergraduate degree course leading to the Master of Pharmacy degree. The pre-registration year is now highly structured, and at the end of it candidates sit a pre-registration examination. In the United States a professional doctorate qualification, the PharmD programme, has become the norm, and this qualification is now being offered by a number of institutions within Europe. American students also undertake a period of pre-registration training, which in the institutional setting is known as a residency programme. This is usually a one-year program of formal education and training in all aspects of pharmacy practice.

Pharmacy education in continental Europe
There remain substantial differences in the education and training of pharmacists within the European Union. In the Netherlands[38], for example, it takes six years to qualify as a pharmacist. There is no formal pre-registration training: instead, there is a six month period of practical experience which is undertaken during the final year of pharmacy school. The first two years of study have a strong emphasis on basic and pharmaceutical sciences. Practical skills are taught during the last two years. Students can take an interim examination after four years, leading to the award of a master’s degree. However, most opt to complete the six-year programme and qualify as pharmacists. They are awarded a diploma similar to the US PharmD qualification. Once qualified, community pharmacists can legally be in charge, although in practice most complete at least two years as an assistant pharmacist first. However, Dutch pharmacists must complete at least three years of on-the-job training before being in charge of a hospital pharmacy.

In Germany federal law regulates the pharmacy curriculum[39], and any change needs to be agreed by all sixteen federal states. However, clinical pharmacy and pharmacotherapy have recently entered 6 the curriculum, and pharmacists are being encouraged to develop critical thinking and clinical problem-solving skills.
solving skills. The Scandinavian countries [40, 41], including Norway, Sweden and Finland, offer two pharmaceutical qualifications. The master of pharmacy degree takes from five to six years to complete, and includes six months of practical experience in a pharmacy. The other qualification is the bachelor of pharmacy degree, which takes three years to complete. In Norway and Sweden this is the qualification of prescriptionists. Pharmacists with masters and bachelor’s degrees have the same responsibilities in relation to the dispensing of prescriptions and the giving of advice to patients and customers, but those with the bachelor’s degree cannot own and run a pharmacy.

Pharmacy education elsewhere
Pharmacy education in the former soviet countries has undergone substantial development in recent years. In Slovakia, for example, pharmacists are educated in the faculty of pharmacy at Comenius University in Bratislava. This is the only pharmacy faculty in Slovakia, and was the only one in the whole of Czechoslovakia between 1960 and 1969. Of the thousand students in the faculty, most are from Slovakia [40]. Pharmacy is studied in English. The undergraduate degree course lasts five years. After completion of the course pharmacists are qualified to practice as assistants in either community or hospital pharmacy, but they cannot be in sole charge of a pharmacy. To be in charge of a community pharmacy, the pharmacist must work as an assistant for two years, and then take a further examination. To be in charge of a hospital pharmacy five years postgraduate experience are required, together with successful completion of a second examination. Many developing countries now have the capacity to train their own pharmacists [42]. In Indonesia, for example, the pharmacy undergraduate course has recently been reduced from five to four years duration [43]. The course is followed by a year’s pre-registration training. The pharmacy curriculum is heavily biased towards pharmaceutics (the preparation of appropriate dosage forms), pharmacobistry (the study of medicinal substances of natural origin), and laboratory work. Pre-registration trainees have to attend lectures as well as gaining experience in all spheres of pharmacy practice, including hospital, community, industry, and with the ministry of health. Indonesian pharmacists therefore tend to have a wide knowledge of all areas of pharmacy practice but insufficient experience of any one branch of practice. Pre-registration trainees then have to complete both written and oral examinations. There are sixteen faculties of pharmacy in Indonesia, of which eight are part of private universities. Pharmacy education is regulated by the ministry of education.

The Regulation of Pharmacy
In virtually all countries pharmacy is a self-regulating profession with its own regulatory and disciplinary bodies. In Great Britain, for example, the Royal Pharmaceutical Society combines three roles: it acts as registration authority, representative body and inspection service. The Society’s powers are embodied in statutes, and registration with the society is a legal requirement in order to practice pharmacy. It publishes an annual Register of Pharmaceutical Chemists. The Society’s second role is to promote the profession of pharmacy and to represent its members. Finally, it has statutory responsibilities with regard to the inspection of pharmacy premises and the testing of medicines. The Society itself is governed by a Council, which includes elected members together with Privy Council nominees. The cornerstone of the pharmacist’s professional status is educational attainment. Although there remain considerable discrepancies between the educational attainments of pharmacists in different countries, there is increasing mobility of pharmacists between them. There are, for example, mobility agreements between the countries of the European Union, subject to competence in the relevant language, although the actual number of pharmacists who have taken advantage of this facility is so far low. Pharmacists who have qualified in other countries can apply for registration with the Royal Pharmaceutical Society of Great Britain, for example, in order to work in the United Kingdom. This usually involves attendance at a course lasting up to one year. There are also reciprocal agreements operating between a number of countries, such as that between Great Britain, Australia, New Zealand and Northern Ireland. Most countries now have written standards of practice for pharmacists, usually established by the appropriate professional body. The Royal Pharmaceutical Society of Great Britain, for example, issues such guidance to its members at regular intervals [44]. Those who contravene these standards may find themselves before the Statutory Committee, which has the power to remove individuals from the Register of Pharmaceutical Chemists. Similar arrangements, including registration and inspection of premises, exist in most other countries, although the extent to which they are enforced is variable. Problems of enforcement tend to be greater in developing countries. Less than one in three developing countries have fully functioning drug regulatory authorities, and between ten and twenty per cent of sampled drugs fail quality control tests [45].

Establishment of GPC
The GPC should be manned by a dedicated team of pharmacy practice and pharmaceutical policy experts who develop standard guidelines for pharmacy practice that reflects contemporary best practice for pharmacy. These standard guidelines should be designed in such a way to be easy to understand, flexible, and consultative and can be tailored to different models of care globally. There should be key elements within each standard guideline that demonstrate competency in the identified area of pharmacy practice. The accompanying narrative for each standard element describes the specific criteria for evaluation of the pharmacy practice to determine consistency with the standard for the overall management of specialty pharmaceuticals and clinical pharmacy management of patients. The GPC should maintain an adequate and well-trained workforce for high-quality patient care by introducing amendments in the pharmacy curriculum globally. This GPC should have proper mechanisms for ensuring that all
pharmacists are in good standing around the globe where they are licensed/registered/certified through central body verification of licensure, registration, certifications, and continuing education requirements. In addition, GPC should establish a Pharmacy Resource Center (PRC) that contains information and tools that pharmacy practitioners of all experience levels may find helpful for developing their practice, expanding their knowledge base, and keeping up-to-date with new advancements in pharmacy practice. This PRC section should be managed by the section of specialty pharmacy practitioners.

GPC should act as a leader in offering exceptional professional development and continuing education, reinforcing commitment to elevating the vital role that pharmacists play as patient care providers. As one of the largest accredited providers of continuing education for pharmacists, GPC should have resources to help pharmacists succeed in advancing career and engage in meaningful professional learning activities. In addition, GPC should provide multidisciplinary professional development for pharmacists and pharmacy technicians. Activities should be available in many different formats for members and non-members on the website. Furthermore, GPC should offer continuing education, professional certificates, board review and recertification resources, and a residency matching service.

Aims and objectives
The aim and objective of the establishment of GPC is to highlight universal professional identity of pharmacists as healthcare practitioners. This GPC should also enhance the impact of the profession of pharmacy on people’s lives in the context of healthcare trends. The following core objectives of GPC are as follows:

a) Multi country comparable data studies in variability in pharmacy practice, licensing, registration and examination.
b) Collation and analysis of variability in pharmacy practice in member organizations’ countries.
c) Multi country analysis of pharmacist key responsibilities and services outcomes.
d) Build international recognition of universal professional identity of pharmacists as healthcare practitioners, its role, policies and value, and to influence, promote and secure acceptance of pharmacy practice as an important and integral part of healthcare systems.

e) Decisions, actions, and recommendations of the GPC should be routinely communicated to continental and subordinate bodies.

Functions of GPC
a) Describe the mission of the pharmacy profession to society
b) Elaborate on the role of the pharmacist as a member of a health care team
c) Describe new perspectives in pharmacy practice
d) Define good pharmacy practice in all sectors and settings
e) Describe the knowledge, skills, and attitudes required for good patient-focused pharmacy practice
f) Describe some new roles that pharmacists can assume
g) Describe the changes in education and policy necessary to implement patient-focused pharmacy practice.

Discussion
Interest in the importance of professional identity and its influence on pharmacy practice is growing[^46][^48]. Elvey et al.[^49] identified 9 unique identities of pharmacists, which they argued lead to role confusion and a lack of clear professional direction. Gregory and Austin[^21] examined how pharmacists navigated personal health crises and reliance on professional identity; their findings suggested that pharmacists may have incomplete professional identity formation compared to physicians and nurses. There appears to be some growing consensus that pharmacists lack a clear professional identity.

Numerous theories, from a broad range of paradigms, exist in the literature[^37][^39]. Identities are complex, so there are different ways to discuss them. Borrowing from theories in medicine, in Teaching Medical Professionalism, Monrouxe[^50] explored individual, interactional and institutional theories of professional identity in the context of health professions. We can use this structure to help understand the professional identity of pharmacists. Individual identity theory is focused on the notion that identity is situated within an individual, constructed in one’s mind. This is in essence “the self,” which is the starting point to understanding identity for many. Erik Erikson[^51] is a key theorist in this paradigm. Using a psychoanalytic approach, he proposed 8 stages (psychosocial crisis) in which we pass from infancy to adulthood. During each transition, a “crisis” point will occur that facilitates examination
of roles and drives subsequent changes. Each stage is associated with the discarding of one identity and the acquisition of a new identity. It is these crises that encourage individuals to reexamine their attitudes about themselves and the world, allowing some beliefs to be discarded and others integrated into new identity constructs\(^5\). From a professional identity perspective, individuals move through stages of professional development. In pharmacy, individuals move from learners in classrooms, to learners in experiential rotations, to novice pharmacists, to experienced pharmacists, and so on. Change from one stage to another is not gradual but rather characterized by abrupt discontinuities that are triggered by the emerging crisis. This phenomenon is important, as the transition from a dispensing pharmacist identity to a clinician pharmacist identity will require a “crisis” of sorts to drive the change, not gradual improvements over time or occasional education sessions on how to make decisions or provide clinical services. An example of a crisis that may drive change is a shift to outcomes-based payment. If pharmacists are paid based on improved patient outcomes, providing dispensing services alone will not be economically sustainable. In contrast to individual theories, interactional identity theories are rooted in social constructionism. From this perspective, professional identities are co-constructed through language, artifacts, and action and are continuously renegotiated \(^{37-39}\). Identity as a social construct is best epitomized by the work of Erving Goffman\(^5\) and his seminal work, *The Presentation of Self in Everyday Life*. Goffman uses the analogy of a play to discuss the intricacies of identity, which is a collection of how people present themselves (e.g., actor) and how others (e.g., audience) interpret this. Since all people have multiple identities (e.g., profession, gender, ethnicity), the presiding identity is specific to the person’s setting and is selected based on which is likely to lead to the best outcome. Goffman’s theory is exemplified by the recent transition of pharmacists to immunizers. A significant number of pharmacists likely never considered administering injections, as this was not a personally defined professional goal. Despite this, these pharmacists will probably need to provide immunization services, as their colleagues will expect it and the public will demand it. This is problematic for identity formation, specifically the adoption of the immunizer identity, as it creates a conflict for the individual pharmacist to resolve. It may not be personally desirable to adopt the immunizer identity, but pharmacists may be ostracized by colleagues and the public if they do not internalize it. In these circumstances, which goals affect the adoption of the identity depends on which will lead to the most favorable outcome for the individual. This example highlights the importance and complexity of interactional identity theories for the profession.

**Summary**

We argue that the pharmacy profession is practicing in varying forms and degrees around the world and still being viewed through an antiquated lens and there is a lack of consensus to clearly articulate the professional identity of a pharmacist. Therefore, GPC establishment is a real need of time in the contexts of development, centralized professional socialization, education, formation, and identity. An ideal profession is said to have its standards of education, practice is legally recognized by licensure, and the profession is relatively autonomous with members having a strong sense of identity. Using these parameters then pharmacy practice appears to fulfill many of these in its assertion of qualifying as a universal profession.

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Figure 1: GPC as a central body unit connecting with the whole world
Table 1: Number of registered pharmacists per 100,000 Population for 24 Middle and Lower Income Countries

| Country     | No. of registered pharmacist | Population (000) | Pharmacist/100,000 population |
|-------------|------------------------------|------------------|------------------------------|
| Slovenia    | 695                          | 1,988            | 35                           |
| Jamaica     | 860                          | 2,576            | 33                           |
| Belarus     | 3,230                        | 10,187           | 32                           |
| Azerbaijan  | 2,505                        | 8,041            | 31                           |
| Singapore   | 1,135                        | 4,018            | 28                           |
| Thailand    | 15,475                       | 62,820           | 25                           |
| South Africa| 10,690                       | 43,309           | 23                           |
| Chile       | 3,000                        | 15,211           | 20                           |
| Bulgaria    | 1,315                        | 7,949            | 17                           |
| Malaysia    | 3,560                        | 22,218           | 16                           |
| Tajikistan  | 730                          | 6,087            | 12                           |
| Bosnia      | 440                          | 3,977            | 11                           |
| Georgia     | 438                          | 5,262            | 8.3                          |
| Romania     | 1,600                        | 22,438           | 7.1                          |
| India       | 300,000                      | 1,008,937        | 30                           |
| Russia      | 9,340                        | 145,491          | 6.4                          |
| Kyrgyzstan  | 275                          | 4,921            | 5.6                          |
| Armenia     | 136                          | 3,787            | 3.6                          |
| Uzbekistan  | 755                          | 24,881           | 3.0                          |
| Albania     | 85                           | 3,134            | 2.7                          |
| Zimbabwe    | 335                          | 12,627           | 2.7                          |
| Tanzania    | 850                          | 35,119           | 2.2                          |
| Eritrea     | 53                           | 3,659            | 1.4                          |
| Gambia      | 10                           | 1,303            | 0.8                          |

Sources: All population figures are from ‘World Population Prospects: The 2000 Revision’, United Nations Population Division (2001). Figures for numbers of pharmacists or ratio of pharmacists to population are taken from the OECD Data Base (2001); ‘The Compendium of Health Statistics’, thirteenth edition (2001), Office of Health Economics; the WHO Europe ‘Health for All’ Data Base (2001); or from the registration authorities of specific countries.
### Table 2: Regulatory and licensing agencies (n=56 countries and territories)

| Agency Type                          | Percent (n) |
|--------------------------------------|-------------|
| Council or Board (non-governmental)  | 44.6% (25)  |
| Government agency or Ministry        | 41.1% (23)  |
| Academia sector                      | 14.3% (8)   |
| Total                                | 100% (56)   |

### Table 3: Maintenance requirements for registered pharmacists

| Requirement                        | Percent (n) |
|------------------------------------|-------------|
| Credit point system                | 75.8% (25)  |
| Combined portfolio and credits     | 21.2% (07)  |
| Peer review                        | 15.2% (05)  |
| Portfolio based                    | 12.1% (01)  |
| Other                              | 24.2% (08)  |
| Total                              | 148.5%      |

### Table 4: The Pharmacists’ Education; Core Pharmaceutical Subjects

| Subject                          | Description                                                                 |
|----------------------------------|------------------------------------------------------------------------------|
| Pharmacology                     | Study of the actions and uses of medicines including absorption, distribution and excretion from the body |
| Pharmaceutics                    | The conversion of medicinal substances into suitable dosage forms such as tablets, injections and inhalers |
| Pharmaceutical chemistry         | Study of the chemistry of medicinal substances including their synthesis and analysis |
| Pharmacognosy                    | The study of medicinal substances of natural origin                          |
| Social and administrative pharmacy | Study of the social, political and economic aspects of the use of medicines |