Modernization of drug distribution in Kurdistan

Is it possible to implement the Swedish drug distribution system in Kurdistan?

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Abstract

A well functioning pharmacy business is in place when medication is provided safely, in sufficient quantities, and with enough good quality in such a way that everyone in the population who needs the drug receives it when they need it. Previously, it has been confirmed that computer systems have been a successful method to facilitate the distribution of drugs. The current study aimed to compare the Swedish pharmacy business system with the Kurdish, and explore whether or not it is possible to apply the Swedish organisation of pharmacy business in Kurdistan.

The study was carried out partly in Sweden and partly in Kurdistan, and involved finding information from (drug companies to wholesaler to pharmacies and to patients) in both places. The information was collected using the websites of different authorities and interviewing personnel at a pharmacy in Sweden. In Kurdistan, however, the collected information was based only on interviews with relevant authorities and pharmacies.

The drug distribution system in Sweden differed largely with the Kurdish system. There is computerized system along the entire distribution system in Sweden, in contrast to almost only paper work in the Kurdish distribution system, and hardly any computers are available. The personnel of the Kurdish pharmacies consisted of uneducated people, while in Sweden the personnel in the pharmacies have to be pharmacists or technicians. All interviewees in Kurdistan believed that there are possibilities for Kurdish people to apply the Swedish pharmacy business in Kurdistan, but one step at a time. During the study, it was clear that the situation in Kurdistan was more about security than computerizing system. Kurdistan is in need of changing/improving the personnel in the pharmacies and the quality of drugs before all other parts.

Since the drug distribution in Kurdistan and the rest of the world always is under development and an on-going process, further studies with new methods should be done in these areas to manage to come up with new successful solutions.

Keywords: Pharmacy business, Sweden, Kurdistan, Computer system, illegal drugs in Kurdistan.
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1. Introduction
A well functioning pharmacy business is in place when medication is provided safely, in sufficient quantities, and with enough good quality in such a way that everyone in the population who needs the drug receives it when they need it (1). In most societies it is unacceptable that e.g. a retired man has to visit five to six pharmacies just in order to get his daily medication for prostate, or a child’s mother walking around to find the antibiotic in oral suspension form to give it to her child. It is extremely important to make sure that the pharmaceutical supply works well. In order to ensure that pharmacy business is working optimally and is able to offer all the drugs and services and maintain security. Multiple numbers of studies about pharmacy business have been published; these articles have been about comparison between pharmacies and pharmaceutical care business in Europe (14).

1.1 History
The pharmacy business is a wide area that includes for example dispensing of drug and all laws that have to be followed in the pharmacy. In addition to all the laws and regulations required operating the pharmacy business, it is also necessary to have proficient and educated staff consisting of pharmacists. Pharmacists are experts of drugs and have an extensive role in pharmacy business (2). Globally, changes always occur in the pharmacy industry having an influence on the population and differ between countries. The differences usually depend on the country’s regime and the financial resources (3).

The development of pharmacy and pharmaceutical care in Europe took place in the middle of the 1900s. In Sweden, the apothecary received originally privileges for the entire life from the king. This system continued until the 1900s (figure 1).

The pharmacy proprietor could, if he/she wished sell his privilege. But this law was abolished in the beginning of 1900s. In the late of the 60’s, the pharmacy business financial problems increased (5). The Swedish government submitted a proposition (prop. 1970:74) of a new pharmaceutical providing in 1970 (6). The proposal was consisted of for example a stronger pharmacy business and that the pharmacies could adapt to the development of drug, technically and economically. “Apoteksbolaget AB” was the new name of the owners of the pharmacy, 1988 the name was changed to “Apoteket AB”. The state now owned two-thirds and The Swedish Academy of
Pharmaceutical Sciences (Apotekarsocieteten) owned one third of the “Apoteket AB” (6). The owners of “Apoteket AB” were unchanged until 1981. Later, “Apotekarsocieteten” sold their possession to others, and finally the government bought all shares and now there was only the government as the owner of the “Apoteket AB” (6).

First in 2006 the parliament of Sweden started to think of how the pharmacy market can be reregulated and can be owned by private owners again (7). The parliament decided in 2009 that the pharmacy market is now reregulated and “Apoteket AB” was for sale (6).

1.2 Computer system
To apply an advanced IT-development, was one of the most compelling reasons for creating “Apoteksbolaget” in Sweden. This process was hardly surprising tough for “Apoteksbolaget”; furthermore the development of creating computer system in pharmacies was very slow (5). The pharmacists also feared the implications of the IT-development (datasystem) in the pharmacies, which “Apoteksbolaget” was going to establish in the mid 1980s. The staff of the pharmacies demanded to be trained and they got it, they called it “prata data”, “computer talk”. Kerstin Beckman-Danielsson said: “We were much worried that it would be great rationalizations, but it wasn’t that that bad, we thought that it would be very fast, but it was very slow, and we also thought that it would be a society of paperless, but we still don’t have” (9).

Medication errors occur in the pharmacies occasionally, the errors can vary between mild intolerances and life-threatening allergic reactions. The electronic health records reduces the patient safety problems, it helps you for example to avoid providing wrong information about the dosage, the strength. It also helps you to avoid other problems like drug-drug interactions (10). The electronic prescription even assures patient safety and efficiency, it avoids counterfeits with the paper prescriptions.
Another difficulty with handwritten prescriptions and paper medical documents is that pharmacies dispense drugs to patients after the physician has finished the treatment (11). In addition, pharmacists will be helped to avoid making too many errors and they can smoothly and rapidly offer more time to serve the patients.

1.3 Pharmacy in the rest of the world
There are only a few published studies on how pharmacy and pharmaceutical care business work in Middle East. A study was made about some Middle East countries and their pharmacy. Most of these countries are in close proximity to each other and have similar culture, society and language. The challenges that Middle East faces in their pharmacies are the same challenges other countries outside of the Middle East region face (15). Iraq is one of these Middle East countries mentioned in this study. As all people know, the situation in Iraq has been tough in the last 10 years. The population of Iraq is approximately 28 million, which consists mainly of Arabs and Kurds. There are 7 public schools of pharmacy in Iraq and the schools have suffered a lack of academic staff. The presence of illegal street selling of drug has led to suffering the pharmacy business and the role of community pharmacists has been undermined. The counterfeit drugs and drugs of deficient quality are also results of drug shortages and the poor drug regulations (16).

1 Apotekarsocieteten – former the organization consisted of pharmacy owners but now it is an independent organization in Sweden that promotes better knowledge of drug (8)
Recently, Mason has published a study on pharmacy education and business in Iraq, and she describes the situation as “pharmaceutical chaos” and she claims that there are many obstacles for patients of receiving drugs thanks to the bad quality of drug and education (17). The pharmacy business in the Middle East countries resembles each other; a study reported that the private sector is popular in Jordan, where 93% of all pharmacists work private (18).

A study from South Korea was made about how huge success the reform in South Korea in 2000 was, that the authority made. Before, the doctors were dispensing medications and pharmacists were prescribing drugs to patients in South Korea. Today the patients get their drugs only from pharmacies using prescriptions only from their doctors (12).

This resulted not only in modification of medical services, but also in modification of the price of the drugs. Many reactions from the health care market occurred for example that foreign pharmaceutical companies threaten to dominate in Korea’s drug market. Another problem with the reform was that pharmacists supplied prescriptions illegally at patients’ request (13). Abuse of antibiotics was dropped dramatically two years after the reform, because you now must get prescription from doctor to get antibiotic (13).

1.4 Kurdistan

Kurdistan Regional Government (KRG) is semi autonomous and governs the three big provinces of Sulaymaniyah, Erbil and Duhok comprising of total 3.8 million people in 2006 (figure 2). They have an independent parliament, Prime Minister and president (19). The pharmacies in Kurdistan are poorly organized and the drugs are badly stored, have bad quality and shortage of deliveries. There are absences of patient- records and documents, computer system, and Internet in their pharmacies (20).

![Figure 2. The map of Iraq. The green area belongs to Kurdistan (21).](image)

“Civilians dying from bad medications”, the Kurdish Globe says in the newspaper’s website (22). Many medical clinics were closed because of counterfeit and inferior
drugs. The ministry of health in Kurdistan wants to stop the import of the expired, illegal and low quality medication. The main reasons to low quality drugs in the pharmacies in Kurdistan are free trade, smuggling and the bad work of Quality Control (Medical Products Agency) (22). “Drugs are imported from different countries such as China and India not because of their effectiveness and strength, but because of low prices”, a pharmacist said to the Kurdish Globe. He added that there are 14 different types of omeprazole with 14 different prices; each one is imported from a different country (23).

Recent reforms in the Western world have been focused on reducing the rising costs of drugs. While in Kurdistan, it is a different kind of reform that is in focus - it is about ensuring quality drug distribution to the population.

In 2006, there were 64 millions of prescriptions done in the pharmacies in Sweden. Among these prescriptions, there were 14 981 error dispensing and 44 of these were seriously cases, i.e. life threatening (24). This was happening despite the fact that well educated personnel and computer systems are used to prevent dispensing wrong medication. The errors are easier to make in those countries, including Kurdistan that has neither good educated personnel nor computer systems in their pharmacies.

Since the Kurdish part of Iraq is being rebuilt in all industries, it is exciting to see if there is any willingness to modernize the pharmacy business as well. In recent years there have been rumours in the media and news that Kurdish people want to establish modern pharmacies as in Europe, particularly Sweden (25). Currently the pharmacy business in Kurdistan represents nearly the Swedish during the 1960s, when individual owners owned the pharmacies in Sweden and there were no computer system available (7).

All distribution of drugs to the patients occur manually in the pharmacies in Kurdistan, the question is how the pharmacists make sure that everything occurs in a proper manner, in comparison with the pharmacies in Sweden. The aim of this study will also be to check if Kurdistan can step by step follow the Swedish successful development between 1970 and 2000. But first, It will be explored how the Swedish and the Kurdish pharmacies work currently.

1.5 Aim
The aim of this study is to compare the Swedish pharmacy business system with the Kurdish, and explore whether it is possible to apply the Swedish organisation of pharmacy business in Kurdistan, northern Iraq.

1.5.1 Questions
The aim can be broken down into several research questions

- How does the distribution chain works from the companies to the pharmacies?
- How is pharmacies governed and who is determining as well as responsible for it?
- How do the pharmacy works and what qualifications are required to work in a pharmacy in both Sweden and Kurdistan?
• How do the patients get the right drug in most cases? Are there much medication errors?
• What are the rules and routines concerning drug expedition and all other employments in pharmacy for both, personnel and patients?
• Are there any other authorities that have any responsibilities in the pharmacy, if so, what?
• What is the regulatory framework and application of the pharmaceutical benefits (discount) and payment?
• Can the Swedish pharmacy business system be applied in Kurdistan just like that? If not, why?
• Are there any obstacles to apply the Swedish pharmacy business in Kurdistan? If so, what and how can they be addressed?

2. Methods

The literature search was done using the websites PubMed and Google. All literature articles were conducted between 15/11-2012 and 5/12-2012 using keywords modernization of pharmacy business, computer system, reform of pharmacy, electronic prescription and pharmacy in Kurdistan. These words resulted in more than 1000 articles. However, there were only a couple of articles about computer system.

In this study, various methods were used to get information about the laws and routines in the pharmacy business system in Sweden and Kurdistan. It is important to use many different sources of data when comparing different countries with respect to drugs supplies and other similar research. During the study, it is important to understand what, why and how things work. In this case, multiple methods like measuring, qualitative understanding and theorizing have to be used (27).

The study was performed using websites of the authorities in Sweden and interviews in Kurdistan. The interview method was used because the qualitative answers are easier to obtain in interviews than other methods like questionnaires. All questions during the interviews were open questions, which means the interviewee gives you broader information than yes or no. In order to understand more about how interviews are designed, how the interviews are organized and also how the questions are prepared, a book called (Den kvalitativa forskningsintervjun) was used (28).

There are many types to construct interview questions to an interview study. The interviewer himself decides how the interview should look like. You can for example explain the purpose by asking direct questions in the beginning of the interview. There is another alternative to start the interview with, which is indirect questions and the purpose will be explained at the end of the interview instead. The later technique is called funnel technique. A good interview question should be thematic to produce the knowledge, and it should be dynamic to create a good interaction in the interview (28).

The information from Sweden was gained by searching through the websites of the authorities. Questions to all interviews were performed separately several days before the interviews (Appendix I-VII). The interviews contained between 8-15 questions for
each interview, depending on the interviewee. Many questions were identical to all interviews. The questions were written in English, but the interviews were performed in Kurdish. All interviews were recorded by the Mobile phone. The interviews with deans of the Universities and manager of the Quality Control were scheduled. But all other interviews were drop in interviews, because of the abundance of patients.

No names are mentioned in the study, because all who participated in the study wished to be anonymous.

All questions during the interviews were prepared based on the research questions in the study (above). The answers to these questions should be found during the study period. Multi-method is conducted of two or more studies rigorously; it results to get the whole results of your study. The causal interferences of the studies are more trustworthy using multi method designs. It is also important to use both quantitative and qualitative to approach a study in particular (27).

2.1 Sweden

2.1.1 Tamro
There are two wholesalers in Sweden, Kronans droghandel (KD) and Tamro. Since both wholesalers function almost in the same way, it was enough to take one of them. The interview questions were sent by email to the head office of the wholesaler (Tamro) in Gothenburg (appendix I). The information about the transportation of drug from the drug companies to the wholesaler and further to pharmacies was obtained from the marketing communications manager from Tamro, about a week. The answers to the questions contained also the laws and routines governing the work at Tamro.

2.1.2 Government, Läkemedelsverket & Socialstyrelsen
The laws and regulations of the drug distribution in Sweden were found from the authorities, the Government Offices of Sweden (Regeringen), Medical Products Agency (läkemedelsverket) and The National Board of Health and Welfare (Socialstyrelsen) using their websites, www.regeringen.se, www.lakemedelsverket.se and www.socialstyrelsen.se.

2.1.3 Pharmacy
The daily routines in the pharmacy (e.g. prescription management and computer system) were received by an interview with a pharmacy manager in (ICA Cura apotek) in Jönköping. The interview was recorded and later it was written down, to ensure that no information is forgotten (appendix II). The interview took about 45 minutes (2012-12-11). A book was used to complement the interview (Receptföreskrifter-tolkningar och kommentarer, 5:e utgåvan) to study laws and routines at the pharmacy.

2.2 Kurdistan
I visited Kurdistan, northern Iraq in 4 January 2013, to get the information about the laws and regulations, but also to study the situation at the pharmacies in real-life. A presentation of the Swedish pharmacy business was presented for all who were interviewed in Kurdistan. Same questions were used to different persons during the
interviews, to verify for example whether the given information is the same to everyone or not. I was well treated with great respect by all the people I interviewed.

2.2.1 University of Duhok
An interview was booked with the dean (anaesthetist) of the University of Pharmacy in Duhok the day after I was arrived in Kurdistan. The interview was recorded (2013-01-10) and I managed to ask my questions not more than 30 minutes, because he had more encounters to be present in.

At the same day I had another interview with a lecturer (Master in pharmacy) at the University of Duhok who also worked in the Quality Control (Medical Products Agency) in Kurdistan. This interview was also recorded (2013-01-10) and took around 60 minutes. The following questions were asked to both, the dean and the lecturer (appendix III).

2.2.2 University of Hawler (Erbil)
After several hours of waiting, I finally had an interview with the dean of university in pharmacy in Erbil. The interview took place in 20 minutes and was recorded (2013-01-15). The following questions were asked (appendix III). The dean (Professor) of the university suggested that I would get more information by interviewing the manager of the Quality Control in Kurdistan; he called him at once and reserved an interview for me with the manager of the Quality Control

2.2.3 Manager of Quality Control (MPA)
All my questions were answered by the manager (Master in pharmacy) of the MPA in his office in Erbil. The interview was recorded in 45 minutes (2013-01-21). Following questions took place in the interview (appendix IV).

2.2.4 Manager of syndicate of pharmacists in Kurdistan (Trade union)
In the same day I had an interview with the manager (retired pharmacist) of the Trade union (farmaceutiska fackförening). The interview was recorded and was about 30 minutes (2013-01-21) (appendix V).

2.2.5 Madkhar (drugstore)
A drugstore works like wholesaler, they get drugs from the drug companies and transport them to the pharmacies. There are governmental drugstores that transport drugs to only the governmental pharmacies. There are also private drugstores as well that transport drugs to the private pharmacies.

I interviewed a governmental drugstore and I just watched a private drugstore, because they work just like each other. The owners of both drugstores were educated to nurse. Both drugstores were in the city called Akre. The interview with the governmental drugstore, which is located in the hospital, was recorded and took 60 minutes (2013-01-16). Some pictures were taken in the governmental drugstore and the private drugstore. The prepared questions for the interview were the following (appendix VI).

2.2.6 Pharmacy
As I mentioned above, there are governmental pharmacies and private pharmacies. Same questions were asked to all pharmacies (appendix VII). There was a mix of pharmacies, new, old, big and small. The personnel who worked at the pharmacies had different education (no educated personnel, healthcare personnel and
pharmacists). But the majority of the pharmacies had nurses as personnel. Two governmental pharmacies were interviewed in about 30-40 minutes (2013-01-24). The interviews were recorded and pictures were taken. These two governmental pharmacies were located in Akre.

I interviewed sex private pharmacies as well (2013-12-(25-28)). The two of the pharmacies I interviewed were in Duhok and the rest were in Akre. Many of the pharmacies were photographed. All interviews were done at the pharmacies. The interviews were recorded and they took about 20-30 minutes, because of there were a lot of people who were waiting to get their drugs. Each pharmacy was consisted of 3-5 persons.

The responses I got from the interviews are compiled according to the principles mentioned in the book of (Kvale, et al). The quotations are interpreted and written on my own words. There are special references for the result chapter. The quotations are short and only the best quotations are used in the text (28).

3. Result

The authorities in Sweden have own websites and offer all the laws and procedures for the public. While in Kurdistan, nothing is saved in paper or computer, but all laws and regulations are orally.

The stages of the drug distribution are almost the same in both Sweden and Kurdistan (figure 3), but contain different laws and regulations. The drug is manufactured in the drug companies; the drug is sent to the wholesalers and later it is leaved to the pharmacies and patients. But there are major differences in how the stages are performed between the countries.

Figure 3. The stages of the drug distribution in Kurdistan and Sweden.
There are two sections of drug distribution in Kurdistan, the governmental section and the private section. These two ways are completely independent from each other and there is no relation between the ways. The government is responsible for the drug distribution in the governmental section and the Trade Union (Syndicate of Kurdistan pharmacists) is responsible for the private section. Quality Control (Kurdish corresponding MPA) inspects all places that exist medication to ensure that all laws and regulations are followed. Kurdistan has an own Quality Control, because of the political problems between Iraq and the Kurdish region, northern Iraq. Another reason is that the borders of Iraq are not well controlled by smuggling of drugs with poor quality.

All laws and regulations about the drug distribution in Sweden are legislative by the Parliament of Sweden. There is only one section of the drug distribution in Sweden, a private section. All people except physicians and drug manufacturers may run a pharmacy. All pharmacies get their drug from same places and there is a connection between all pharmacies, whether it is private pharmacies or other pharmacies owned by companies. The Medical Products Agency has the big control over all drugs in the Sweden. It says in the website of the Swedish parliament.

3.1 From Drug Company to the wholesaler (Sweden)
The drug that sells in the Swedish pharmacies comes from drug companies inside and outside of Sweden. The Medical Products Agency, MPA has the responsibility to inspect all drugs before being sold in the market. According to LVFS 2013:4 in 5 §, it says that all places that manufacture an active substance have to be inspected by the MPA, to ensure that Good Manufacturing Practice (GMP) is followed before it will be exported to Sweden or to another country. During an inspection of drug manufacturing, the MPA examines for instance quality system, organization and personnel, manufacturing premises and laboratories, equipment and relevant documents. All these areas have to comply with the GMP-requirements. This inspection is regularly performed every two years.

Those who are entitled to engage in the wholesale distribution of drugs, they must have received permission from the MPA. Pharmaceutical companies that are licensed to manufacture drugs also have permission to distribute their drugs to pharmacies. MPA has regulations to be followed by wholesalers. The wholesalers should have a management system for planning, execution, monitoring and developing the quality and safety of practice. The quality in the wholesalers should fulfill Good Distribution Practice (GDP) and GMP, as it says in LVFS 2009:11 2 Kap. 1 §. All personnel are educated and obliged to document everything they perform.

Tamro (wholesaler) has three distribution warehouses spread over Sweden. The head office is in Gothenburg. Most drug companies have an agreement with Tamro to have a central warehouse (centrallager) at Tamro. Central warehouses belong to the drug companies that have agreement with Tamro to keep their drugs after the manufacture.

3.1.1 Order and transportation
Tamro takes care of the transportation of the goods from the drug companies to one of the three distribution centers, where the drugs are sent to the pharmacies afterwards. The transportation occurs by special drivers and cars. The cars have to be equipped in a way that the drugs are protected in the way they should be protected.
Tamro offers all to have a central warehouse at Tamro, the producing companies but also the marketing companies and parallel dealers. For those companies who have a warehouse at Tamro, the transportation of drug to Tamro is relatively frequent (IV). But for those who don’t have any central warehouse (no agreement with Tamro) at Tamro, the transportation of drug from these companies is about once per week. The orders of the drugs occur either manually or automatically by the computer systems. In the beginning of each month, the providers receive an invoicing certification on how much goods they have sold, and then Tamro receives an invoice (IV).

The central warehouse of Tamro is a storage place for companies to keep their drugs. The goods from drug companies that are kept by Tamro are in Consignation. Consignation means that the provider who owns the goods delivers the goods to the wholesaler but retains the ownership of the goods. The safekeeping of the drug in the central warehouse is free as long as the drugs are located at Tamro. Tamro are liable to pay to the drug companies only when the drugs are delivered to the pharmacies. Tamro sends a bill to the companies once a month on the amount of drugs that are delivered to the pharmacies (IV).

3.2 From Drug Company to the wholesaler (Kurdistan)

The private and governmental section must obey all laws and regulations from the Kurdish parliament. There are several drug companies in Kurdistan who manufacture medication in a very good quality (e.g. Awamedica) (V). A company called FDAS in United Kingdom investigates all drugs manufactured in the companies of Kurdistan, northern Iraq. Samples of drugs are sent all the way to United Kingdom to be examined and to be approved (the building of FDAS company in Kurdistan is not finished yet). In addition, the Kurdish Quality Control also investigates the drugs manufactured in Kurdistan. There is also a Quality Control for whole Iraq, but the Quality Control in Kurdistan requires stricter conditions (VI).

3.2.1 Order and transportation

A pharmacist who has seven years of experience in the pharmacy, then he/she can start a company (VII). The company functions like a wholesaler in Sweden. Both, the department of health, department of commerce and the Quality Control must give permission to the pharmacist to start such a company (wholesaler/vendor). The company makes a contract with all drug companies inside of Kurdistan and abroad (e.g. Pfizer, Awamedica and Actavis). The pharmacist, who owns the wholesaler in Kurdistan, is responsible of all defects in drugs. The vendor itself takes care of the transportation inside of Kurdistan (VIII).

There are also drugstores (Madkhar) in Kurdistan. Drugstores order their drugs from the wholesaler by manually writing the name of the drug, quantity, company name, and price using a form (figure 4a). All the orders and the transportations are recorded and documented on paper (figure 4b) (IX).
The Kurdish parliament has decided that even batch number and expired date should exist on the form that as of 1/3-2013. A Madkhar is storage for saving drugs in (figure 5) (IX).

Only a pharmacist can own a drugstore, if the pharmacist has three years of experience in the pharmacy. You have to apply for permission from the Trade union in order to open a drugstore, and each drugstore should offer drugs up to 10 pharmacies (VII).

The manager of the drugstore said that his drugstore is inspected almost regularly by the Quality Control. “They inspect both the temperature of the premises and the expire date of the drugs.”
3.3 From wholesaler to the pharmacy (Sweden)

The orders of the pharmacies are all automatically; the pharmacies enter their orders by their computer system anytime of the day. At a specific time of the day the wholesaler pick, pack and deliver the goods to each pharmacy (figure 6a). The pharmacies receive their orders every weekday within 24 hours from the time the order was made. Sometimes the pharmacies get their deliveries at night, the driver of the goods has a key to the storage location then. You can also order individual reservations in accordance with the patient’s request, even this occurs via computer system in the pharmacy and the wholesaler gets the order by their computer system. The transportation of the drug from the wholesaler to the pharmacy is taken care of the wholesaler (IV).

The MPA examines for instance quality system, organization and personnel, premises and laboratories, equipment and relevant documents. All these areas have to comply with the GMP-requirements (III).

According to the Swedish law, each one who wants to run a community pharmacy in Sweden must get permission from the authority, the MPA. MPA assesses the application regarding how the business complies with the requirements of the law (2009:366), about the trafficking in drugs and the regulations of the MPA (LVFS 2009:8). In addition, the MPA inspects the pharmacies regularly to confirm that all laws are obeyed (III).

When drugs have arrived the pharmacy every morning five days a week. All drugs must be removed from the crates and will be put in the pharmacy’s shelves as soon as possible (X). All drugs have their own places in the shelves and you find the places with the help of computer systems, by printing out a list of the drugs that should be arrived today (figure 6b). In the list you can see what drugs are coming today, how many, in which crates they are and in which box of the pharmacy they should be in. Using the computer you also know the amount of goods you have got today (X).
3.4 From wholesaler to the pharmacy (Kurdistan)
A pharmacist can as well own a pharmacy by getting permission from the Trade union in Kurdistan, and the condition is that the pharmacist should have at least three years of experience in the pharmacy. The Trade union examines if a pharmacy is really necessary at this place (VII).

It costs a lot for pharmacists to run a pharmacy, for that reason the pharmacists can instead sell their graduate degree (bachelor degree) to a wealthy man that can run a pharmacy. It does not matter whether or not the wealthy man is educated to a pharmacist. The pharmacist is registered as owner, however the rich man is the real owner of the pharmacy. The pharmacists get their salaries every month even without working at the pharmacy (VI).

A pharmacy can order drugs by calling or sending a form to the Madkhar (figure 7). Following things have to be including in the form (name of the drug, strength and the frequency). It generally takes a couple of hours for Madkhar to provide the drugs to the pharmacy. Thus, it takes a short time for pharmacies to get their drugs, because the Madkhar is located near to the pharmacies that usually get their drugs from. The Madkhar is responsible of the transportation (VI).

![Figure 7. A form with orders from pharmacy is sent to the Madkhar.](image)

3.5 From pharmacy to the patient (Sweden)
A pharmacy is always inspected by the MPA. According to LVFS 2009, the MPA controls for instance the personnel, premises and equipment, storage of drugs, documentation and archiving (III).

Socialstyrelsen (The National Board of Health and Welfare, NBHW) gives all of the personnel in the pharmacy the permission to work (Legitimation to Pharmacist and Pharmacy technician), and therefore, the NBHW always has the control of all personnel’s work in the pharmacy. If any of the personnel does an error (e.g. dispensing error medication), then the NBHW takes care of and investigates the case (XI).
The laws at the LVFS 2009:8 say that every community pharmacy shall have staffs that have enough skills to ensure a good quality and safety (III). At least one pharmacist must be available on the pharmacy during the opening hours. All services and training the staffs implement will be documented. Every pharmacy must have a drug manager (läkemedelsansvarig). The drug manager’s tasks are for example to ensure that the pharmacy meets the requirements of self-control and that everything that is conducted continuously is documented. The MPA also mention in LVFS 2009:8, that following things shown (below) must be followed in the pharmacy (III).

- Always have at least one pharmacist present while the pharmacy is open.
- Have appropriate premises (e.g. the doors are locked and alarmed, and the place is accessible for the disabled people.
- Show that all information, electronic prescriptions can be received, and give all information about the sale to the Apotekens Service AB.
- Have a self-inspection program (quality system).
- Be able to delivering Schengen certificate.
- Receive discarded drugs from the public.
- Provide installment.
- Offer giving information and counseling on drugs and drug use.

3.5.1 Dispensing prescription drug

The manager of the pharmacy went through all the steps (below) of the dispensing of prescription drugs, during the interview. All prescription drugs are dispensed in the way shown on the picture below (figure 8).

![Image: Dispensing prescription drug](image)

Figure 8. All pharmacists go through these steps when dispensing prescription drugs.

Prescription

Pharmacists may dispense prescription drugs only if the patients have prescription. There are different prescriptions such as telephone, fax, paper and electronic prescription (appendices (VIII-XII)). All these prescriptions are filled in the same manner. On a prescription you can find including the name and the personal number of the patient, the name and the strength of the drug, and the contact details of the physician.
Manual control of prescriptions
The pharmacist controls prescription for instance by checking that the prescriber is authorized and the strength of the drug is right. All boxes in the prescription form have to be correctly filled. If something is unclear or wrong, the prescriber has to be contacted.

Paper prescriptions
If patients get paper prescriptions such as telephone, fax or a normal paper prescription, then you have to first transfer/register the prescription into the computer to archive the prescription electronically. You start by entering the personal identity number to identify who gets the drug in order to archive the prescription in the computer system.

Electronic prescriptions
It requires only that the patients show their identity cards that contain a personal identity number. The pharmacists then have access to all the prescriptions the patients have. This works in the following characteristics, the physicians prescribe the prescriptions in their own computer system and the prescriptions will be sent electronically to all pharmacies in Sweden.

Choice of drug
The pharmacists choose the right drug in the computer system and it prints a picking list from the computer. It facilitates for you to find the drug quickly. After you picked up the drug from the shelf, you manually control the packaging by checking the expired date and any damages. Afterwards you scan the product by the computer’s scanner to ensure that it is correct drug you picked up.

Labeling of the packaging
All pharmaceutical packaging have to be labeled with the patient’s name, the prescriber’s name, indication and instruction, the name of the pharmacist and pharmacy, and the expired date (figure 9). The label should remain on the packages throughout the treatment.

![Figure 9. An example of labelling on the package.](image)

Dispensing of the drug to the patient
The drug will be provided to the patient in connection with information such as when and how the patient will take the drug. Even some common side effects can be mentioned for the patient here.
Payment of drug
In the end the computer system shows the price of the drug. The patients may pay either in cash or bankcard. There is also an opportunity to pay with installment.

Reimbursement system (Högkostnadsskydd)
It means that patients do not have to pay more than 2200 SEK per year for the drug, which is included in the benefit (the drug that are discounted) and you get it on the prescription. This is applied regardless which pharmacy in the country you go to.

All pharmacies shall function in the same way for the patients, for that reason all community pharmacies must have permission to a number of databases, registers and other IT-infrastructure to run their business. In order to keep all information about the dispensing of drugs updated, all these information must be transferred to Apotekens Service AB. The pharmacies are obliged to have an electronic system to get the information about the patients in connection with the dispensing of drugs, and this information is obtained from Apotekens Service AB (XII).

In Sweden, there are two types of educations to get a pharmacist degree. The first one is a Bachelor degree, three years (Receptarie), and the second one is a master degree, five years (Apotekare). Both of them are pharmacists and are registered by NBHW. The NBHW also takes care of serious medication errors (X).

The regular control every month inside of the pharmacy is for instance, inventory and sustainability of the drugs. All these controls are very handy; you have everything automatically in the computer system (figure 10). But there is also a big inspection from the MPA once every year (X).

Figure 10. Some pictures of a Swedish pharmacy.
3.6 From pharmacy to the patient (Kurdistan)
The pharmacist education (Bachelor degree) takes five years. In the morning, the governmental pharmacies are opened as long as the hospital is open. Most of them are located in hospitals (figure 11) (I, V). None of the personnel in the governmental pharmacies I visited was educated to pharmacist, but to nurse. The private pharmacies start to open first at 04.00 pm and they are located around the town (figure 12), all of the personnel were nurses even in the private pharmacies (VIII).

During the interview one personnel in a pharmacy said that the most of the personnel work at the governmental pharmacies in the morning, and in the evening they work in the private pharmacies.

The manager of the Quality Control said: “The law says that drugs by prescription only can be dispensed for maximum 3 months at a time, and the prescription will be archived at the pharmacy.” All the information about the prescription and the
dispensing should be computerized. The prescription must be written clearly and should contain the drug name, strength, frequency, and indication (VIII). Pharmacists must staff all pharmacies according to law. Unfortunately you can as well find teachers, healthcare professionals, and uneducated people almost in every pharmacy selling drugs. These people do not even know what indication the drugs have. Even private clinics sell drugs though the law says no. The reason of that is that there were not many pharmacists in Kurdistan in the beginning of 1990. Between 1991 and 2000, there were 10-15 pharmacists in whole Duhok city (VI).

In reality you never see an indication on a prescription (figure 14). Prescription is required for drugs intended for CNS, antipsychotics, and antidepressant. Otherwise everyone can receive their medications regardless if they have prescriptions or not. Consequently there is considerable abuse of all kinds of drugs (VIII). The manager of the Quality Control said "You and I could visit any pharmacy anywhere across Iraq and get a bag full of antibiotics and antihypertensive. The reason is that people always have threatened the pharmacies if they did not get their drug without prescription".

So far, the pharmacies have functioned as a regular store; only leave drug to patients against money without any prescription and giving any information of the drug. Increasing the control of the entire distribution stage gradually strengthens the laws. The security police and Quality Control take care of the control of the drugs in the pharmacies. They investigate for instance the sustainability of the drugs and counterfeit drugs (VIII).

Computers are a big problem in the entire Iraq. Most of the personnel have never used computer and do not know how it works. Nevertheless, some pharmacies have computers (figure 13), but the computers are only used to check the pharmacies costs and the balance of the drug (V).

Dispensing errors are uncontrollable and untraceable; there are several dispensing errors per hour. The lecturer from the Duhok University said with a smile "If we register all dispensing errors from the pharmacies in one hour, the computer will blow up". He gave an example on how easy it can occur. “One patient came in the pharmacy and showed an empty package from (Sandos) of a drug for migraine and asked if we had anything like this. A colleague of mine, who was a nurse, gave digoxin from (Sandos), just because both packages looked similar and was from the
same drug company. The personnel did not understand that the active substance and the name of the package are two different things. The patient ended up in hospital without any knowledge of the reason”.

3.6.1 Dispensing prescription drug
All pharmacies had the same routine concerning dispensing prescription drug. Anyone can enter the pharmacy with or (sometimes) without prescription to receive the drug. The personnel in pharmacy manually bring all drugs, at the patient’s request (figure 14).

An employed in a pharmacy that was a teacher by profession, and the manager of the Quality Control, said that there is a regular control from the Quality Control and security police. They control the drug distribution system, drug misuse, pharmacy and smuggling. Even the Ministry of Health and the Trade union have a little control of these areas.

I interviewed eight persons from different pharmacies. I wanted to see more pharmacies but the time was not enough. Only one of the managers I interviewed was an educated pharmacist. All other staffs were people with education as e.g. teachers, nurses, but even without educations.

All personnel in the pharmacies were agreed that the price is flexible, there is a limit for how high you can sell your drugs, but there is no limit for how low the price should be. One of the managers of the pharmacies that I interviewed said: “If I see that the patient is poor, I usually sell the drug for the price I bought, or sometimes I give it to them for free”.

All who were interviewed in Kurdistan answered almost the same regarding practicing the Swedish drug distribution in Kurdistan, that it is not impossible to implement the Swedish drug distribution. The manager of the Quality Control said,
“We can slowly but surely, step by step develop our system of the drug distribution. Firstly, there is no relation between the pharmacies and prescribers that otherwise can be very helpful for good distribution of drugs”. The lecturer said “We have already started the developments, before e.g. we got drugs against diarrhea and it was just sugar pills, nowadays all drug’s effect is controlled by the Quality Control of the Kurdistan before it comes to the market”. He also added “We are working on to stabilize the prices for all drugs in all pharmacies. There are also thoughts about having computerized prescription i.e. the prescriptions will be written electronically”.

The manager of the Quality Control said, “We do not have any central computer system in Kurdistan to have a connection between all the authorities, and the network is very slow”. He also mentioned another important point, “We have identity cards but we do not have any social number or personal identity number in whole Iraq. There is not much information and often even not correct information on the card”.

The dean of the Duhok University said, “Another big problem that we have in Iraq and Kurdistan, is that for instance we have now a Minister of Health. He wants to do something good within five years. After two years we get a new Minister of Health who wants to change everything the previous Minister planned to do within five years. He even does not consider whether or not it is good”.

The greatest problem is nonetheless the electricity. Iraq, including Kurdistan, does not have electricity permanently (V). “We have electricity for example every 4-6 hours, then we get a break in 1-3 hours. This is the biggest problem we have to change if we want to have computerized pharmacies in Kurdistan”, said the dean of the Hawler University. He suggested at last that a pilot study would be a good attempt. Since the governmental hospitals have electricity around the clock, we could introduce computer system in one hospital to see what happens (V).

4. Discussion

Many researchers have explained that multi methods studies are very important within for example pharmacy policy (27).

This work has studied the laws and regulations in the pharmacy business and its differences in Sweden and Kurdistan. The study was done using literature reviews and qualitative interviews. The majority of the study particularly highlights the view of those who were interviewed with focus on drug distribution and pharmacy business.

4.1 Method

A big different between the two countries is that all authorities in Sweden have own websites and offer all the laws and procedures as files to the public. While in Kurdistan, nothing is saved on paper or computer, but all laws and regulations are orally. Almost all information produced from Sweden is from the desired authorities’ websites, and the Kurdish information of the laws and routines is gained from the interviews from different authorities.
I want to state that the information about the laws and regulations you get from interviews is not as reliable as from guidebooks. You cannot rely on all information the interviewee gives you, because human beings always forget and interpret and can give wrong information. In comparison with the information written in a guidebook, it cannot be forgotten because you always have the possibility to go back and read. On the other hand interviews provide a picture of how legislations are implemented and used in daily life.

4.1.1 Sweden

4.1.1.1 Tamro
There are two wholesalers in Sweden. Since both of them function similarly it was enough to get information only from one of them. Tamro was elected because it has existed for longer time. The information gained from Tamro could be better by visiting the place and make interviews with different persons inside the wholesaler. The plan first was to visit the wholesaler available in Gothenburg, interview different people and even get some pictures inside the wholesaler, to get a bigger view of the wholesaler. But the management of Tamro refused the plan, because of the professional secrecy.

4.1.1.2 Government, Läkemedelsverket & Socialstyrelsen
Laws and regulations about the pharmacy business were gained by the websites of respective authority (Government, MPA and NBHW), which is much easier way than interviewing each authority.

4.1.1.3 Pharmacy
Basically all pharmacies function equally in Sweden; therefore only one manager of a pharmacy was interviewed. This led also to minimize the time. The book (Receptföreskrifter), which contains regulations of dispensing prescription drugs, was used as well, to ensure that the information received from the manager of the pharmacy is correct.

4.1.2 Kurdistan
The Kurdish authorities have no guidebooks like books and files saved as Sweden, therefore interviewing was the only way to get answers of how the laws and regulations work in Kurdistan. If the study was repeated now, I would like to interview some patients at each pharmacy that was interviewed as well, in order to see what they think about the pharmacies and the drugs they receive. This idea was invented after I was arrived back to Sweden.

4.1.2.1 Madkhar & pharmacies
The manager of the Madkhar was nurse as profession and had worked in this place more than 20 years. He had much information on the place and routines, but he did not know much about the indication of the drugs.

4.2 Result

4.2.1 From Drug Company to the wholesaler
There is only one section of the drug distribution in Sweden, i.e. all Swedish pharmacies receive their drugs from the same places (wholesalers). Which means that
all pharmacies in the whole country get drugs from the same wholesalers, which in turn leads to a good connection in the whole distribution system.

While in Kurdistan there are two sections, the governmental and the private section. These two ways are two different separate parts. Which makes it difficult to have a connection between the governmental and the private pharmacies. This is an important point for Kurdish people to consider if they want to copy the Swedish drug distribution system.

In Sweden all have access to run a wholesaler, after they receive permission from the MPA. The pharmaceutical companies have also permission to distribute their drugs directly to the pharmacies. Whereas in Kurdistan, only the pharmacists have the permission to run wholesalers, with conditions that the pharmacist has experiences in pharmacy at least in three years.

The authority that inspects the drug companies and wholesalers is MPA, in Sweden. MPA inspects everything from organization and personnel to manufacturing premises and laboratories in the pharmaceutical companies. In Kurdistan, the Quality Control and a pharmaceutical company from UK investigate the pharmaceutical companies inside Kurdistan. The inspections of the pharmaceutical companies in Kurdistan should be stricter to be as good as Sweden.

All orders and documentations are recorded and saved by computer systems in Sweden. In Kurdistan there is all manually, they save all orders and documentations as paper (figure 4b).

**4.2.2 From wholesaler to the pharmacy**

The wholesalers take care of the transportation of the drugs, in both, Sweden and Kurdistan. There are two wholesalers in Sweden and both are private. There are two parts of wholesalers in Kurdistan, the private and governmental. There is one more thing in Kurdistan, called Madkhar (drugstore) that is owned of pharmacists as well. This distinguishes both countries from each other. Drugs are sent from wholesaler to the drugstore (smaller wholesaler) before they continue to go to the pharmacies, in Kurdistan. In Sweden, the drugs are sent from wholesaler to the pharmacies directly. There are no drugstores in Sweden.

All Swedish pharmacies enter their orders by their computer systems. The orders automatically go to the wholesalers’ computer systems. The orders are delivered to the pharmacies within 24 hours; the wholesalers deliver the goods to the pharmacies five days per week. The Kurdish pharmacies, both, private and governmental pharmacies fill the form of the orders and send it to the Madkhar manually (figure 7). The Madkhar delivers the drugs to pharmacies within 2-3 hours. The time for the drug to go from the drugstore to the pharmacy is much shorter than Sweden. I think Sweden should mimic the Kurdish way. Otherwise the Kurdish pharmacies have to follow the order system that Sweden has, i.e. computerized orders. Entering orders manually using forms is not safe. You can for instance order drugs from drugstore to yourself or someone else without anyone seeing it, because there is no control of the drug balance in the pharmacy and the forms always can be discarded. There have to be a central system that shows all orders made from all pharmacies, just like Sweden.
In Sweden pharmacies can be owned by anyone, regardless if they are educated pharmacists or not. But pharmacists have to be present in the pharmacies always. This is very good because the pharmacists are experts of the drugs and have better knowledge about drugs than everyone. The Kurdish law says that pharmacies have to be run by pharmacists and only pharmacists should be staffed when the pharmacies are open. But the reality is not as the law says; the pharmacists sell their graduate degree to wealthy men because they do not have enough money to run a pharmacy themselves. You find unfortunately more uneducated personnel than educated pharmacists staffing pharmacies. But the lecturer of the Duhok University mentioned: “since there are insufficient number of pharmacists in Kurdistan, everyone is allowed to work in the pharmacies. But eventually the laws will be stricter on that”.

The pharmacists in Kurdistan cannot run own pharmacies because they cost a lot. Instead they sell their Bachelor degree to wealthy persons that can afford running pharmacies. Pharmacists get their salary from the wealthy persons and beside that they work in hospitals, industry and many other places. The Kurdish pharmacies are full of uneducated persons even though the law says that all pharmacies have to be staffed by pharmacists. Kurdistan should introduce stricter rules about having pharmacists at the pharmacies, as in India. Recently, The Food and Drugs Administration (FDA) of India has demanded to strengthen the law about always having pharmacists at the pharmacies (29).

4.2.3 From pharmacy to the patient

The pharmacies in Sweden are inspected by the MPA. They investigate the personnel, premises and equipment, storage of drugs and documentation and archiving. Even NBHW is involved in the pharmacy when it comes to for instance dispensing errors. This is very good to achieve a standard quality of the drug distribution system. In Kurdistan, both, the Quality Control and the security police control pharmacies, they investigate the sustainability of the drugs and if they sell counterfeit drugs. The dean of the Duhok University said that the government has strengthened the law of the quality of the drugs that enter Kurdistan and Quality Control takes care of it. The question is when will Kurdistan even control the knowledge of the personnel as well.

Approximately 90 % of all prescriptions are electronic prescriptions and 10 % paper prescriptions in Sweden. Sweden is a world leader in electronic prescriptions and many other countries are interested to learn the Swedish model (26). It is an important part of the prescription process in Sweden, because it increases the safety and efficiency of the management. In contrast, the prescriptions of Kurdistan are exclusively paper prescriptions; merely it is a white paper (figure 14). The question is whether it is possible to introduce electronic prescription system in Kurdistan; in this case a central prescription system must be developed in Kurdistan. In order to make it possible, an authority has to handle this.

Another problem is electricity; not only in Kurdistan, but the whole Iraq have not permanent electricity, which Sweden has. Even a central system like the Swedish (Apotekens service AB) is improper without electricity. Since the electricity is unstable in Kurdistan, it is impossible to have computer systems. Otherwise you will be interrupted after every 4-6 hours, while you are dispensing drugs to patients. The
question is when will the electricity be permanently. In addition, the network is very slow in the entire Kurdistan to ensure that things like electronic prescriptions can be sent between physicians and pharmacies. Is the government ready to grab these things in earnest?

There is a basic problem too. As the manager of the Quality Control in Kurdistan observed that the most of the personnel in the pharmacies have not used any computer before. Therefore I think there would be a big resource to teach all staffs in the pharmacies how the computer should be used. Once again, how willing is the government to spend money on it?

Dispensing prescription drugs are numbered in several stages in Sweden. You start to check the ID-card (personal identity number) of the patient to ensure that it is the patient or a relative to the patient. In Kurdistan, you have not any numbers that prove your identity yet. This is a hard obstacle for Kurdish people to change their drug distribution system. The government has to be involved here and this is a best start to the development. But the manager of the Quality Control pointed that Kurdistan is still a part of Iraq. “We have to first be separated from Iraq and later we can make personal identity numbers to our population”.

All prescriptions in Sweden are registered to the computer system in order to archive the prescription electronically. The case is different in Kurdistan, as we mentioned there are only paper prescriptions. To archive prescriptions in the computer systems increase the safety. For example you can always go back and look what drugs the patients have received.

The drugs are dispensed in the Kurdish pharmacies to the patients without any information and label on the packages. While the Swedish drugs are provided to patients with all information required and the packages of the drugs are labelled with the information of for example prescriber’s name, patient’s name, indication etc. (figure 9). This is a very smart way to track if something goes wrong in the future. This is still unavailable for Kurdish pharmacies, because they haven’t any computer system, but also because of the prescribers never write the indication of the drugs. The prescribers should start consider if they can start the to write the indication of the drugs that makes it easy for the pharmacies to give information and label the packages.

There is a reimbursement system in Swedish pharmacies; it says that you pay maximal 2200 SEK per year for all drugs. After that you get all drugs for free. In Kurdistan, there is neither reimbursement nor discount in pharmacies. The personnel in the pharmacy decide if they give discount in dependence whether the patients are needy/poor or not. If Kurdish pharmacies will have reimbursement like Sweden, the government has to legislate it and pay the costs after it is free for the patients.

All interviewees in Kurdistan had same opinion when it comes to implementing the Swedish drug distribution system in Kurdistan. All were agreed that it is possible, that Kurdistan also could look like Sweden in the future, but it will take time and only one thing at a time should be developed. The dean of the Hawler University had a good proposal, regarding to try using computer system in hospitals and see what you happens.
This study confirmed that Kurdistan needs to change a lot of the drug distribution system. During my visit to Kurdistan, I got a clear picture of the situation. They need to improve the security before starting changing anything, e.g. computerizing the system. They have to decrease the dispensing errors that occur everyday, but they also need to control the drugs in a stricter way. The law about pharmacists to staff pharmacies must be stricter as well.

I want to mention the rumours about establishment of pharmacies with the European (especially Swedish) model in Kurdistan. At the end of my work, an article was published in the Swedish newspaper (Dagens Apotek). There were a Kurdish company and a Swedish company that planned to open 300 new pharmacies in the north of Iraq, Kurdistan. But the plan was abandoned because of many different views from people involved in the project. The Swedish company is now looking for new Kurdish company to collaborate with such a project (27).

Finally, since the drug distribution in Kurdistan and the rest of the world always is under development and on going process, further studies with new methods should be done in these areas to manage to come up with new successful solutions.

**Conclusion**

Kurdistan needs to change or improve many things about drug distribution system. But I think the most important thing they should prioritize is security. Low-quality drugs have to be stopped entering Kurdistan to stop imperilling lives. The Kurdish government must strengthen the laws about what drugs should enter the market, the drugs should be investigated in a stricter way by the Quality Control. The dispensing errors have to be reduced as well. In order to decrease the dispensing errors there are many things need to change. But the first and most important I think Kurdistan should change, is prescriptions. They can have paper prescriptions with more information, maybe as well as the Swedish yellow paper prescriptions (appendix VIII).

In Kurdistan you see seldom a pharmacist in the pharmacy, even if the law says the pharmacies have to be staffed by pharmacists. Compared to Sweden, which has always pharmacists present in the pharmacies. Kurdistan should strengthen this law and follow it better. But since there are not many pharmacists in Kurdistan and the education is in five years. Therefore I would like to have a new pharmacist education that resembles the Swedish bachelor degree (Receptarieprogrammet). This will increase the number of the pharmacists in Kurdistan and the chance will now be bigger that pharmacists can staff all pharmacies.

When the orders are made in the pharmacies in Kurdistan, they are arrived within a few hours, using the drugstores (smaller wholesalers). The situation is a little bit harder in Sweden; the orders are arrived within 24 hours. Sweden has for a long time ago thinking about making it better. Therefore I think Sweden should consider of that the Kurdish method.

Kurdistan has many things within the drug distribution system to improve if not change. Sweden has their solutions for most things. It is necessary that all pharmacies
as well as other authorities have computer systems, but there are first more important things that should be taken care, as security.

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The manager of the Quality Control
The manager of the Trade Union
The manager of the Madkhar
All pharmacies I interviewed.

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Appendix I

Frågor till Tamro (grossist)

1. Hur beställer/får ni läkemedel av läkemedelsföretagen?

2. Använder ni ett och samma elektroniska beställningssystem gentemot alla era leverantörer?

3. Sker er beställning av läkemedel helt automatiskt utifrån bestämda beställningspunkter eller bevakas lagret manuellt?

4. Vilka typer av företag levererar läkemedel till er, är de t ex specialiserade importörer av läkemedel, och försäljningsbolag?

5. Hur beställer/får apoteken läkemedel av er? Är apotekens beställningssystem helt integrerat med ert orderhanteringssystem?

6. vem är det som ansvarar för den fysiska transporten av läkemedel till och från er?

7. Hur hanteras en leverans av läkemedel hos er? Har ni ett manuellt lager eller ett automatiserat lager?


Med vänliga hälsningar
Akhtiar Zebari
Appendix II

Questions during the interview with the manager of the pharmacy in Sweden

- What laws and regulations are there about the drug distribution?
- What educations should the staff in the pharmacies have? How many years do you study?
- How does the dispensing process (Expedition av läkemedel med recept) look like? Are there several steps?
- Do you get electronic prescriptions? Is there more electronic or paper prescription nowadays?
- Who takes care of the transportation of drugs to you and from you?
- Do any authority regularly inspect you and your place?
- How do you store drugs? Do you have any regular control in your pharmacy, e.g. the sustainability and the temperature of the drugs?
- Can you dispense drugs without prescription in Sweden?
- Do you have any pharmaceutical benefits (discount)?
Appendix III

Questions during the interview with the deans of the Duhok and Erbil University

- What laws and regulations are there about the drug distribution?
- What educations should the staff in the pharmacies have? How many years do a pharmacist study in Kurdistan?
- Is there any company that owns several pharmacies?
- Are there wholesalers in Kurdistan?
- How does the drug distribution system (from the drug company to the wholesaler and all the way to reach to the patient) in Kurdistan works? Who is responsible for the transportation?
- How do the pharmacy works and what qualifications are required to work in a pharmacy?
- Is it legal to sell the drug outside of the pharmacy? Does it happen?
- Are there any pharmacies in Kurdistan who have any computer in the pharmacy? If so, what purposes do you use these for?
- Are there any authorities that inspect the pharmacies, wholesalers and drug companies? In that case what authorities and what do you inspect/control?
- Do they offer any pharmaceutical benefits (discount) in the pharmacies?
- Can the Swedish pharmacy business system be applied in Kurdistan just like that? Justify your answer!
- If the answer above is (no), what are the obstacles and how can they be addressed?
Appendix IV

Questions during the interview with manager of the Quality Control

- What laws and regulations are there about the drug distribution?

- How does the drug distribution system (from the drug company to the wholesaler and all the way to reach to the patient) in Kurdistan works? Who is responsible for the transportation?

- How is the pharmacy governed and who is determining as well as responsible for it?

- Is there any company that owns several pharmacies?

- Are there wholesalers in Kurdistan?

- Are there any pharmacies in Kurdistan who have any computer in the pharmacy? If so, what purposes do you use these for?

- Do the patients get the right drug in most cases? Are there much medication errors (felexpeditioner)?

- Can you be dispensed in the pharmacy the drug you want without prescription?

- Is it legal to sell the drug outside of the pharmacy? Does it happen?

- Do you inspect the distribution of drugs? Are there any more authorities that inspect the pharmacies, wholesalers and drug companies? In that case what authorities and what do they/you inspect/control?

- What more do you do here at the Quality Control (MPA)? Who works here?

- Can the Swedish pharmacy business system be applied in Kurdistan just like that? Justify your answer!

- If the answer above is (no), what are the obstacles and how can they be addressed?
Appendix V

Questions during the interview with the Manager of syndicate of pharmacists in Kurdistan (Trade union)

- What laws and regulations are there about the drug distribution?
- What role do you have in the distribution of drugs?
- Who decides on who can own a pharmacy, a drugstore or a wholesaler?
- Can you be dispensed in the pharmacy what drug you want without prescription?
- Is it legal to sell the drug outside of the pharmacy? Does it happen?
- Are there electronic prescriptions?
- Do the patients get the right drug in most cases? Are there much medication errors (felexpedtioner)?
- Is there any company that owns several pharmacies?
- Are there wholesalers in Kurdistan?
- Can the Swedish pharmacy business system be applied in Kurdistan just like that? Justify your answer!
- If the answer above is (no), what are the obstacles and how can they be addressed?
Appendix VI

Questions during the interview with the drugstores (Madkhar)

- What laws and routines do you have here?
- What do you do here? Where do you receive your drugs and who gets drugs from you?
- How do the orders occur? Are the orders electronic (computerized) or manually (paper form)?
- Who takes care of the transportation of drugs to you and from you?
- Do any authority regularly inspect you and your place?
- How do you store drugs? Do yourself control e.g. the sustainability and the temperature of the drugs at the drugstore?
- How do you document and saves all the orders and all other important information?
- Do you consider that the Swedish system could fit in Kurdistan?
- Can I take some picture on the drugstore?
Appendix VII

Questions during the interview with all pharmacies

- Who can run a pharmacy? Who gives you the permission?
- What laws and routines do you have in the pharmacy?
- Do you have computer in the pharmacy? In that case, what do you use it for?
- How and by whom do you get your drugs from?
- What educations must the staff have? What educations do your staffs have?
- How do prescriptions look like? Are there electronic prescriptions?
- Which authorities regularly inspect your pharmacy? What do they inspect?
- Do you control the e.g. sustainability and temperature of the drug?
- Do the patients get the right drug in most cases? Are there much medication errors (felexpeditioner)?
- Do you dispense drugs without prescription?
- Do you have any pharmaceutical benefits (discount)?
- Can I take some photographs in the pharmacy?
## Appendix VIII

### Paper prescription

![Prescription Image]

<table>
<thead>
<tr>
<th>Läkemedel</th>
<th>Dosis</th>
<th>Antal</th>
<th>Anvisningarna</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenormin</td>
<td>50 mg</td>
<td>100 st</td>
<td>1 tablett varje morgon för hjärtat.</td>
</tr>
<tr>
<td>Emovat</td>
<td>0,05 %</td>
<td>100 g</td>
<td>Utvärtes mot eksem. Påstrykes tunt morgon och kväll.</td>
</tr>
</tbody>
</table>

**Föreskrivande läkare:**
Johan Johansson
Leg. läkare
Storgatan 1
123 45 Stockholm
Tel. 08-00 00 00

**Föreskrivningsdatum:** 2009-10-01

**Se även:**
- Läkemedelarenna.
- Förinformation.
- Förpackningsupplaga.
- Förpackningsvärde.
Appendix IX

Paper prescription for animals

<table>
<thead>
<tr>
<th>Likemedelssort</th>
<th>styrka</th>
<th>mängd/behandlings tid</th>
<th>Djurslag</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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Dosering, användning, ändamål

<table>
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<tr>
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</thead>
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<td></td>
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</tbody>
</table>

Utformandadatum: [Date]

Förskriverens namn, yrke, telefon, tjänstemöte, adress

---

Appendix IX

Paper prescription for animals

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<thead>
<tr>
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Dosering, användning, ändamål

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</tbody>
</table>

Utformandadatum: [Date]

Förskriverens namn, yrke, telefon, tjänstemöte, adress

---
Appendix X

Paper prescription for specific drugs (e.g. narcotic)
## Electronic prescription

### UTSKRIFT AV ELEKTRONISKT RECEPT

<table>
<thead>
<tr>
<th>Patientens personnummer och namn/Djurägare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gäller 1 år från utfärdandet om inte kortare tid anges nedan.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Särskilda upplysningar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Läkemedels-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behandlingstid eller mängd</th>
<th>Förmånstyp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doserings, användning, ändamål</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Förskrivarens namn, yrke, adress, telefon, tjänsteställe, förskrivarkod, arbetssatskod</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Namn på apoteket som skrivit ut det elektroniska receptet</th>
<th>Datum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person som skrivit ut det elektroniska receptet (datasignatur + namneckning)</td>
<td>Glätighet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Apotekets noteringar</th>
</tr>
</thead>
</table>

---

40
# Appendix XII

## Telephone prescription

![Telephone prescription form](image-url)