

Networked Healthcare

A practical guide to understanding influence networks in the health-care industry

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Abstract A growing number of interrelated stakeholders (SHs) are gaining decision-making power in the health-care market. Pharmaceutical companies are still focusing most of their resources on a single SH group, prescribers. The lack of a systematic understanding of the influence of relationships between all SH groups has resulted in sales and marketing activities, which fail to address the issues pharmaceutical companies are faced with, such as low levels of public trust and decline in physician access. This paper presents a systematic approach, explaining what practical steps a pharmaceutical company can take to gather, map and act upon influence relationship information.

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INTRODUCTION

Who is the true decision maker in today's health-care environment? Is it the physician who diagnoses patients and writes prescriptions? Is it the health insurer who defines reimbursement policies? Or the governmental bodies that regulate drug pricing and the approval process? What about the increasingly self-confident patients, specifically requesting certain treatments or drugs? Not an easy question to answer, especially for a pharmaceutical company that needs to develop winning strategies and allocate resources effectively.

Decision-making power in the health-care industry is fragmenting between a growing number of stakeholders (SHs) who all interact with and depend on each other. The standard practice in the pharmaceutical industry today of allocating most resources to one SH group, prescribers, does not accurately reflect the increasingly networked market reality. Indeed, many of the challenges the industry is facing, such as declining physician access, limited customer loyalty, downward pricing pressure and low levels of public trust are largely a result of this

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one-dimensional business model, which neglects important SH groups and networks. Better understanding SH influence networks thus will be a key to success in the health-care market.

This paper is part of a series in the *Journal of Medical Marketing* on the topic of networked health-care. It focuses on the concrete steps a pharmaceutical company can take to map the different SHs in the networked health-care environment, their influence relationships and the business implications of this knowledge.

THE SITUATION TODAY

Understanding who the most important SHs are in the health-care network and segmenting the market appropriately is a prerequisite for all sales and marketing activities of pharmaceutical companies. But most companies today do not systematically develop this understanding and continue to use traditional segmentation approaches.

Standard segmentation models have usually focused on the analysis of externally bought prescription data amended by practice data (eg number of patients) gathered through the sales force.¹ This leads to a classic portfolio matrix along the axes of 'prescription' and 'potential'. Looking at some examples of new decision makers in the health-care network, such as a substituting pharmacist or a formulary committee, illustrates the shortcomings of traditional segmentation models in accurately reflecting the importance of those new non-prescribing influencers.

In addition, the different SHs and their specific profiles in regional networks are not taken into account. Standard practice in the industry is still to define marketing messages on a national level, which are delivered to the SHs in a 'one size fits all' approach. In addition, the interplay of the SH groups in their networks is ignored. Even though dedicated sales forces for the

most important SH groups exist in many pharmaceutical companies (eg for physicians, for hospitals and for payers), those departments often work in isolation. As a consequence, these SH groups are targeted and managed separately. The growing importance of influencing relationships between those SH groups falls between departmental responsibilities and is thus neglected.

To summarise, most pharmaceutical companies lack a systematic understanding of their most important national and regional SHs and respective network relationships, resulting in sales and marketing activities that fail to adequately address the increasingly networked reality of the market. The result can be seen in challenges such as the worsening public image and declining physician access pharmaceutical companies are experiencing.

APPROACH

If understanding the networked market reality is critical in dealing with and overcoming current challenges, the implications of doing so at a company level in a consistent fashion needs to be addressed. Based on practical experience, this paper proposes a four-step approach demonstrating how pharmaceutical companies can systematically develop an understanding of who is influencing whom in the health-care network:

1. Define network objective: formulating a business objective for analysing networks derived from the overall strategy of a pharmaceutical company.
2. Understand SH landscape: establishing an overview of the main players in the health-care network and the typical influence relationships between them.
3. Identify individual SH relationships: defining a way of capturing and measuring individual influence relationships between SHs in the network.

4. Analyse influence networks: interpreting network data and deriving meaningful conclusions and actions to generate a competitive advantage.

Define network objective

A health-care network can be defined as a group of inter-connected SHs who have a direct or indirect influence on patient health.² SHs can be persons like doctors, pharmacists and nurses or organisations like hospitals, health insurers or patient advocacy groups. The nature of the SHs' relationships can be of different types such as social, professional or contractual. This definition captures all kinds of networks that exist in the market, from a local doctor with her network to groups of national medical associations and their respective interactions.

Long-term business objectives drive the focus of network analysis. Typical objectives are the building of pre-launch product awareness or the increase in prescriptions. Other objectives of network analysis will increasingly include promotion of disease awareness, improvement of prevention or treatment outcomes. To illustrate how the objective defines the analysis focus, let us assume that a company is aiming at increasing patient compliance for a specific product. On a strategic level, the implication is that all SHs who generally influence compliance for this product and their typical relationships need to be identified and described. On a functional level, Marketing and Sales can, for example, examine specific local and regional networks to uncover patterns that lead to a lower compliance level. The defined network objective thus guides the different functions of an organisation in analysing networks.

Understand SH landscape

Before mapping relationships between individual SHs, it is important to

understand what in principle the influencing possibilities are of each SH group. Through a combination of primary and secondary market research, it can be assessed how one group influences other SH groups. As regulations in the health-care market vary by country, this research needs to be country specific. SH groups with a high influence in one country, such as hospital formulary committees, might play only a minor role in other countries. Through this research, qualitative as well as quantitative information about SH influence levels can be gathered. The information on how one SH group influences other SH groups can be captured in a matrix format (see Figure 1).

The matrix organises influence information by SH group relationships. Research from the Dutch health-care market has, for example, shown that two-thirds of all general practitioner (GP) prescriptions in the Netherlands are repeat prescriptions which were initiated by specialists. It is important to understand that the matrix summarises typical influence relationships between SHs on a group level. On an individual level, these relationships can be very different.

Beyond providing a general overview of influencing possibilities in the health-care environment, the matrix reveals information about horizontal and vertical networks in the market. Horizontal networks consist of SHs who are on the same step of the value chain, such as a peer group of GPs who diagnose patients. Vertical networks encompass SHs from different steps of the value chain, for example GPs referring patients to a hospital, the hospital which treats the patients as well as organisations which the hospital refers the patient for rehabilitation. Typically, professional organisations like medical societies form the horizontal networks. At the same time though, they can also be part of vertical networks together with a number of other SH groups.

| Stakeholder Landscape Matrix* | | Influencing stakeholder group | | | |
|-------------------------------|------------------------|--|---|--|-----|
| | | GPs | Specialists (Hospital) | Pharmacists (Retail) | ... |
| Influenced stakeholder group | GPs | <ul style="list-style-type: none"> National, district and regional level associations 60% work in combined or group practices ... | <ul style="list-style-type: none"> 2/3 of all prescriptions are continued by GPs (repeat prescriptions) Member of formulary committees ... | <ul style="list-style-type: none"> Reviewer of prescriptions (medication safety) Substitution possibility High influence if part of group practice ... | |
| | Specialists (Hospital) | <ul style="list-style-type: none"> Referrals to specialists In general small influence ... | <ul style="list-style-type: none"> Organised in professional organisation Tend to be early adopters of new drugs ... | <ul style="list-style-type: none"> Overall no significant interaction/influence ... | |
| | Pharmacists (Retail) | <ul style="list-style-type: none"> 62% of prescriptions is branded (cannot be substituted) ... | <ul style="list-style-type: none"> Low interaction between specialists and retail pharmacists Partners in decision committees ... | <ul style="list-style-type: none"> Pharmacist professional organisation Regularly publishing of guidelines on substitution ... | |
| | ... | | | | |

*sample data

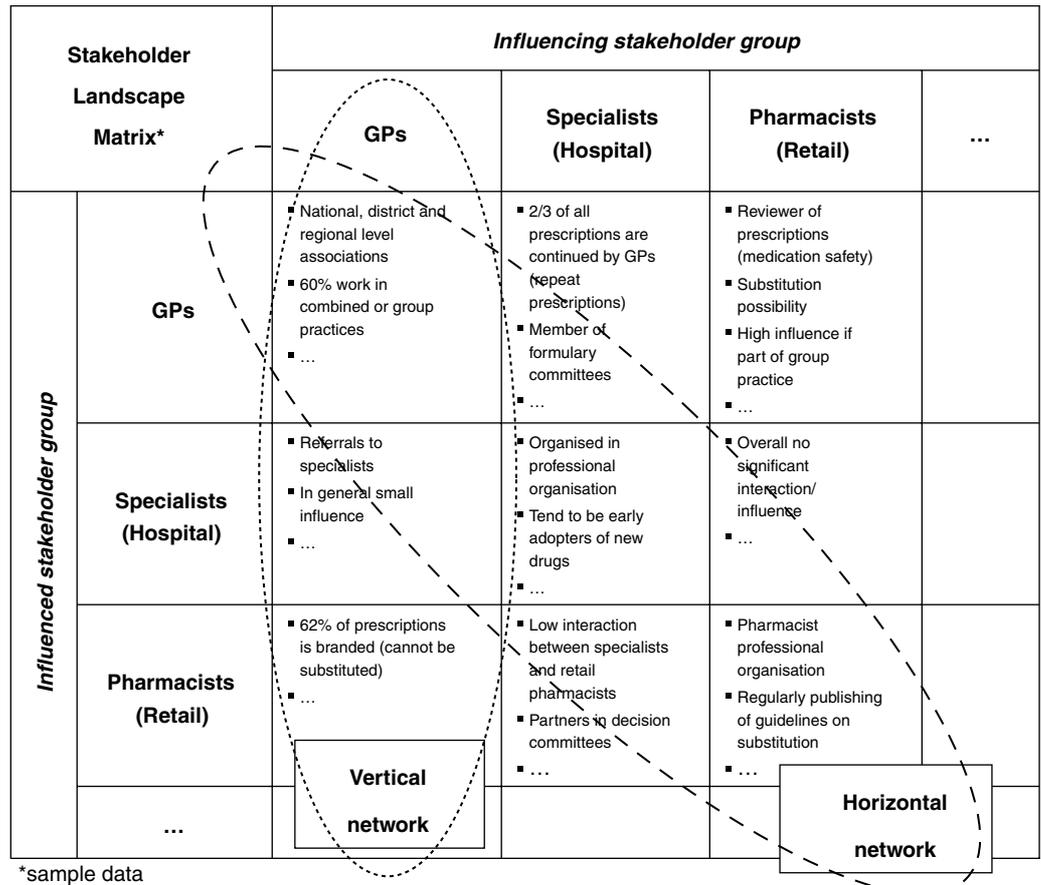


Figure 1: SH landscape matrix.

The value of the SH landscape matrix is that it monitors influence trends on a national level within and across SH groups in a structured way. If updated regularly, it can be used as an early warning system in the strategic planning process, to spot and address changing SH dynamics in the health-care market.

In addition to the general SH landscape matrix, sub-matrices focusing on the defined network objective can also be created. Going back to the topic of patient compliance, this would mean that a specific matrix examining the influence of the different SH groups on the topic of patient compliance is to be developed. Taking diabetes as an example, the matrix contains all SH groups that are related to this indication. This includes GPs,

internists, diabetologists, endocrinologists, nephrologists, ophthalmologists, vascular surgeons, dieticians, podiatrists and nurses. Through research, the typical forms of influence relationships (eg forms of cooperation and patient referral streams) between these SH groups would then need to be gathered. This kind of a matrix allows conclusions to be drawn concerning who the most important SH groups are for this topic and what the key levers are within or across these SH groups to drive patient compliance.

Identify individual SH relationships

Having completed the general SH landscape analysis, the next step is to look at the individual level to understand who

is influencing whom in the health-care network on a one-to-one level. The theoretical foundation of this step is social network analysis, a methodology to quantify social relationships.³ Social network analysis is a well-established and comprehensive methodology originally developed to capture and quantify relationships between individuals in a social context. It is here applied to the health-care network to capture influence relationships between SHs.

At this point, it needs to be specified more precisely what exactly is meant by influence and relationships. In general, influence can be defined as the ability to intentionally or unintentionally control or affect the actions of other people or things.⁴ This definition shows that there are always two or more parties involved and that there has to be a certain kind of relationship between them.

A relationship is defined as a particular type of connection existing between people related to or having dealings with each other.⁵ Relationships can be further described through different dimensions such as type (professional versus social), frequency (regular versus irregular) or direction (unidirectional versus reciprocal). This means that there are numerous ways of describing relationships. To filter out the relationships, which are relevant from a pharmaceutical company's point of view, it is proposed to focus on professional relationships. For this purpose, relevant relationships in a health-care network are defined through the regular exchange of medical and health care-related information between two parties.

Having theoretically defined relationships, the next question is how to practically gather this kind of information. In principle, there are two options. The first one is to buy external data such as patient flow data or survey data that is being offered by medical data providers. Patient flow data reveal the pathways that

patients take in the health-care market, for example from a GP to a specialist, to a hospital and back to a GP. The network perspective in this case is therefore based on referrals only. To reflect a broader perspective (eg influence relationships), medical data providers also conduct surveys where a representative number of SHs are being interviewed. The advantage of this first option is that the work can be outsourced and the data are available relatively quickly. The disadvantage is that relationship data are only available from a limited perspective (eg patient flow) or for a limited number of SHs (ie survey participants). While these data allow the analysis of certain sub-networks, the overall amount of data and its granularity level are not sufficient to comprehensively map influence networks. Furthermore, this sort of data is also available to the competition.

The second option is to collect relationship information in-house through field-based customer interactions. Compared to the first option, more time will be required until a critical mass of data has been gathered. On the other hand, this approach offers the opportunity to build-up proprietary and comprehensive influence and network knowledge, which can be leveraged as a competitive advantage. The following section addresses the concrete steps of field-based data gathering.

As mentioned above, relationships between two SHs can be described through different dimensions such as type, frequency or direction. From a practical perspective, it is sufficient as a first step to determine whether a professional relationship between two parties does or does not exist (binary approach). Relationship data of this kind between two SHs can be captured in a matrix as illustrated in Figure 2.

All SHs seen by the field force are listed in the first column and the first row,

| Stakeholder Influence Matrix | Choice | | | | | Σ (in-degree) |
|------------------------------|--------|-----|-----|-----|-----|----------------------|
| | SH1 | SH2 | SH3 | SH4 | ... | |
| Chooser | SH1 | | 1 | 0 | 1 | 2 |
| | SH2 | 0 | | 0 | 0 | ... |
| | SH3 | 1 | 0 | | 0 | ... |
| | SH4 | 0 | 1 | 0 | | ... |
| | ... | | | | | ... |
| Σ (out-degree) | 1 | ... | ... | ... | | |

Figure 2: SH influence matrix.

respectively. If during a SH interaction a professional relationship with another SH is detected, it can be captured in the matrix by entering ‘1’. The SHs in the first row are called ‘choice’ because they are the ones that are being mentioned as relationship partners by the ‘choosers’ (first column). In the matrix above, SH3 has confirmed a professional relationship with SH1. It is very important that the field force shares a common understanding of what qualifies as a relationship. It can be helpful to agree on a standard way of asking for this information like for example ‘If you have a medical case that you want to discuss, whom do you usually talk to?’

Coming back to the compliance example in the area of diabetes, a good starting point for analysing individual relationships could be regional networks related to diabetes. Information on these networks as well as on their members is often publicly available (eg on the internet). A concrete example in Germany is the ‘Diabetes Netzwerk Deutschland’. This network consists of hospitals, individual doctors and regional doctor networks that are all specialised on diabetes. A regional sub-network within the Diabetes Netzwerk Deutschland is the ‘Arbeitsgemeinschaft Diabetologie Ludwigshafen e.V.’ (working group for diabetes in the area of Ludwigshafen). This

regional network consists of diabetologists, GPs, relevant specialists, specialised nurses as well as patient organisations. The members of this regional network can be listed in the table above and the actual influence relationships between the members and to outside SHs can be captured by the sales force working in the Ludwigshafen area as described above. The captured influence relationships may or may not in the end align with the membership structure of the regional network mentioned above.

Capturing relationship data in this way may seem unrealistic, as the matrix can get very large if all SHs are listed. In fact, the matrix above is only meant to illustrate the method of capturing relationship data. Today’s customer relationship management systems are able to capture this kind of information in a much more user friendly way, by offering a drop-down list with contact names to choose from. The logic behind corresponds to the matrix illustrated above. Filling in relationship information in this way becomes a routine task associated with the regular update of a SH’s profile information.

Whatever the selected method to collect and process the relationship information, the main challenge lies in analysing the raw data and deriving powerful actions out of it to create competitive advantage.

Analyse influence networks

The starting point in the data analysis is the SH influence matrix as described above. For each SH, an interpretation of the matrix scores can be conducted. The row sum is called in-degree and summarises the number of connections as stated by the SH himself. This number reflects how a SH sees her own network (inside perspective). The column sum is called out-degree and is based on the number of times a SH has been mentioned by others. This number shows

| | | |
|-------------------------|-------------|------------|
| out-degree in-degree | High | Low |
| High | Facilitator | Low Impact |
| Low | Expert | Periphery |

Figure 3: SH influence typology.

how a SH's network is being perceived by other SHs (outside perspective). Both scores basically reveal the extent of being connected and thus indirectly the influence a person has within her network.

In a first step, the two scores can be added up and all SHs ranked according to their total score. The higher the total score is, the better connected or embedded the SH is. The SHs with the highest score are likely to be the key opinion leaders in the market. These critical influencers are usually well known to all pharmaceutical companies. Usually, more interesting are the SH with a score that is a little lower. This group of people is otherwise difficult to identify, but they play a vital role in spreading out messages broadly across the health-care network. Knowing who these SHs are can put Marketing and Sales in a position to very efficiently increase reach and speed of message dissemination in the health-care network. This can, for example, be relevant in a product launch phase. After key opinion leaders have been informed and early adopters start using the product, it is important to get the message out to the broad network. Specifically targeting these second-layer influencers can then help to establish the new product more quickly on a local level.

Looking at the total score, it is possible to interpret and classify SHs with distinct scores.⁶ It is however likely that there will be a large group in the middle with an

average score. To further differentiate, especially between the SHs in the middle group, it is necessary to look at both scores separately. The in-degree and out-degree score can be categorised into 'high' and 'low' and compared against each other. The result is four segments, for which the following typology is proposed (see Figure 3).

Facilitator

In case of a high in- and out-degree score, a SH is classified as a Facilitator. The number of ingoing and outgoing relationships is on the same level, meaning that she has a lot of contacts to communicate to and is also perceived by a large number of other persons as a professional relationship partner. The practical consequence is that it is necessary to carefully manage the Facilitator. Because of her high degree of connectedness, her attitudes towards the pharmaceutical company in general and to specific company products and services are likely to spread out quickly across a large number of SHs. On the other hand, the Facilitator is — due to her high network activity — also influenced by many other SHs. This is a high maintenance group that needs to be managed constantly and intensely.

Periphery

If both scores are fairly low, the SH seems to be isolated and does not interact with many other SHs on a professional level. This SH is at the periphery of a health-care network. From a network perspective, the attention to these types of SHs can be limited to a minimum.

Low impact

SHs with a high in-degree score but a low out-degree score are called Low Impact. There are two possible interpretations for this segment. One is that the SHs in this group are juniors who reach out to many

other SHs for advice, but are still little known. The other interpretation is that SHs in this group are attempting to be influential by contacting many other SHs, but are not being perceived as professional relationship partners by many other SHs. While regular sales and marketing activities can be regularly undertaken with these customers, the influence on the broader network will be limited.

Expert

The final group has a low in-degree score but high out-degree score. This means that the SH does himself not actively reach out to a lot of SHs but he is consulted by many others. In this sense, they can be considered as Experts. This group is probably not easy to reach (because of a more passive role in the network) but they can be ‘hidden diamonds’ if they have or develop a positive attitude towards the pharmaceutical company. Basically, the Experts influence a large amount of other SHs without themselves being influenced by many others (as opposed to the Facilitator). From a network perspective, this group is very valuable and deserves high investments such as tailored services or programmes.

The analysis of the scores as described above does allow the drawing of conclusions regarding the different types of influencers in a network and how to manage them. It does not, however, give a picture of what the actual network of a SH literally looks like. In fact, information that is organised in a matrix as described above is difficult to imagine as a network picture. Visualising influence relationships in a graphical way is therefore almost mandatory. This is especially true when considering the potential end users of this information, such as sales representatives or product managers. Graphical rendering tools can visualise network data in a user friendly way (see Figure 4).

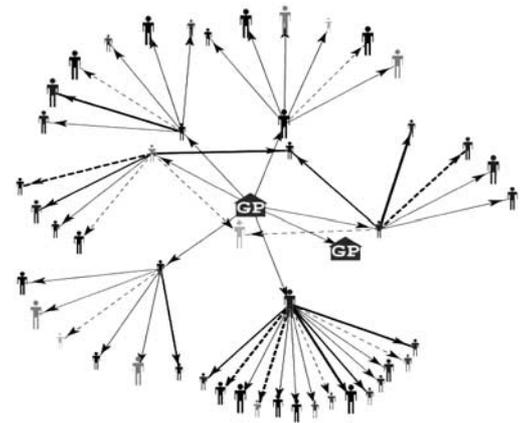


Figure 4: Network visualisation.

An appropriate visualisation tool is capable of transforming network information, including the scores of the relationships, into a network picture. Indeed, the visualisation itself is another step in the data analysis as it enables intuitive interpretation of network data. More sophisticated tools will offer filtering capabilities which support the end user in identifying and examining different types of networks. As an example, a filtering could be done on horizontal networks, such as all physicians of a certain specialty in private practices in a certain region. The displayed networks and high-scoring SHs within them can be targeted with a specific campaign, tailored to this therapeutic area and this step in the health-care value chain.

Another interesting starting point from a Marketing perspective is to identify horizontal networks, for example one hospital in a region with all its SH relationships. The SHs in this kind of network could be targeted in an end-to-end campaign, dealing with all steps in the health-care process. Taking again the example of increasing patient compliance for diabetes, a well-orchestrated programme covering all SHs and steps in the process can be developed for this network. For example, patients can be educated with an information toolkit that

explains all steps from prevention to treatment and rehabilitation specifically for this region. At the same time, physicians can be supported through early detection programmes (eg trainings or special devices that simplify the diagnosis) and specific courses or support material on how to educate and motivate patients for compliant therapy behaviour. Hospitals, in turn, can be targeted with special information about effective treatments and where to refer the patients to for rehabilitation. Finally, patients might be addressed with special reminder services or devices to increase their compliance, for example on the frequency of measuring and recording blood sugar levels.

Of course, all of these activities need to comply with national health-care legislation and/or relevant codes of practice for marketing and promotion. Some of these activities are already performed by pharmaceutical companies. The innovation is that these activities are tailored to the specific needs of a local or regional network and that they are carried out — especially from a timing point of view — in an integrated fashion.

Finally, the visualisation can support the individual sales representative to better prepare for a call and better understand the SH and its network. Visualisation can demonstrate the impact of regional policies of a health insurance on the different SHs in a regional network. Network analysis can also help sales representatives overcome or deal with access limitations. Knowing the relevant network, the sales representative can either try to get recommended by another SH in the network or specifically target a ‘Facilitator’ or ‘Expert’ in the network so that messages spread out, even if not all SHs can be directly accessed.

In summary, network analysis enhances the ability for pharmaceutical companies to better understand and serve current and emerging new SHs and to be more

successful in the market. On the one hand, it helps to increase the effectiveness of activities that are already being performed today by pharmaceutical companies (eg improvement of marketing communication and better preparation of sales calls). On the other hand, understanding the health-care network enables a pharmaceutical company to achieve competitive advantage by developing new market interaction strategies and services that are tailored to the specific needs of different SHs in the context of their network.

CONCLUSION AND OUTLOOK

This paper outlines the practical steps as to how a pharmaceutical company can map and interpret influence relationships between SHs in the health-care market. The last section has illustrated the opportunities that lie in understanding networks and acting upon this knowledge. While network analysis can be a source of competitive advantage, it also demands — if taken to its logical conclusion — a different way of working in the functions of a pharmaceutical company. Knowing local networks and understanding different types of influencers in a network will be of limited value if the Marketing and Sales operations continue working in the traditional way. Knowing more about the network requires acting and communicating with the network SHs in a more tailored way. The internal organisational implications of becoming truly network oriented will be addressed in the next paper of the networked health-care series. The final part of the series will deal with how to successfully integrate into the health-care network.

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