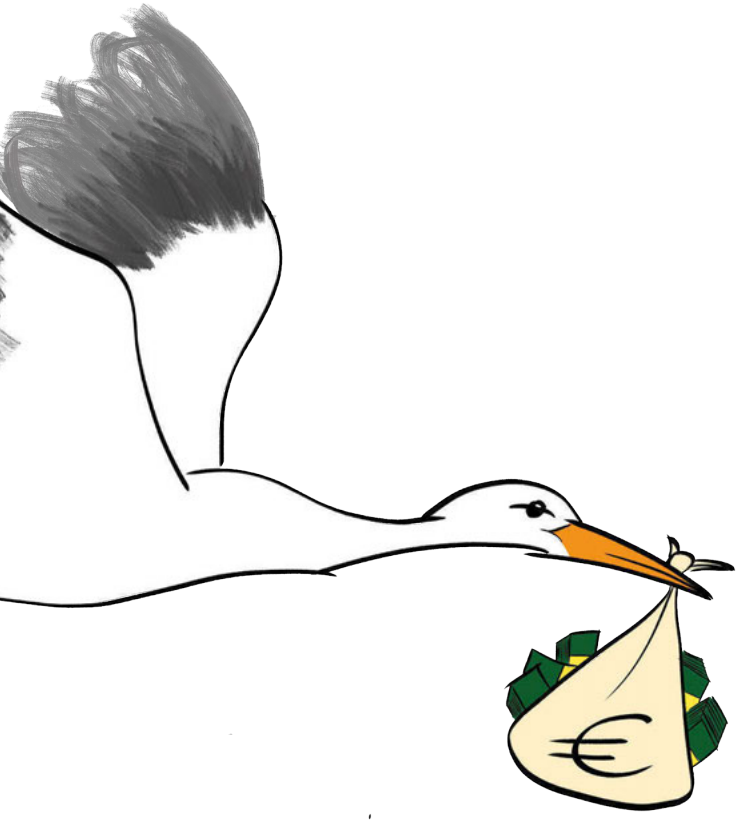
# A bundle of joy? Evaluating bundled payments for maternity care in the Netherlands

Scheefhals, Z.T.M.



# Chapter 1

## General introduction

## Maternity care in the Netherlands

The European Perinatal Health Report of 2008, in which the Netherlands ranked third out of the 26 included European countries in terms of highest perinatal mortality, marked the starting point for a period of significant change in Dutch maternity care (1-3). In response to the European report, the Steering Committee on Pregnancy and Childbirth was established in the Netherlands. In its 2009 report (4), the Steering Committee formulated seven recommendations[2] aimed at optimizing care during pregnancy and childbirth. Based on this, numerous policy measures have been taken in recent years to improve collaboration and the quality of maternity care in the Netherlands. Examples of measures that were taken since (or shortly before) are the implementation of the preconception consultation (2008), the expansion of neonatal screening (2008), the establishment of the Perinatal Audit Netherlands (2011) and the College for Perinatal Care (2011) and the development and adoption of the Care Standard for Integrated Maternity Care (2016) (5). Next to this, regional Maternity Care Networks (MCNs) were intensified in order to improve collaboration and coordination between all disciplines involved in providing maternity care (i.e., midwives, obstetricians, postpartum care providers, general practitioners, pediatricians and anesthesiologists). This has resulted in a nationwide network of MCNs. In addition to strengthening collaboration between providers within maternity care, more attention was also paid to health promotion and the connection between maternity care and the social domain to further improve the quality of care and health outcomes for mothers and children (5).

The Netherlands has a strong history and culture of home births, which has strengthened the position of community midwives (6, 7). Obstetricians and midwives in the Netherlands have a long but also complicated history as providers of maternity care. The two disciplines have always had different perspectives on what constitutes a pregnancy and what is the role and purpose of maternity care (6, 8, 9). While midwives tend to consider pregnancy a natural process, that requires little to no interference as long as things are progressing in a ‘normal’ healthy way; obstetricians tend to have a more medical perspective on pregnancy considering it a relatively high-risk life event that requires close monitoring and timely intervention if complications

2 1. Mother and child at the center; 2. Healthy aging starts in the womb; 3. Well-informed pregnant women; 4. Shared responsibility; 5. Targeted support for disadvantaged women; 6. Continuous support during labor; 7. 24/7 Availability and accessibility.

arise (6, 8, 9). The long-standing difference in perspectives between midwifes and obstetricians has often resulted in tensions, both at the national and regional level between professional associations and at the individual level. Effective collaboration can become challenging when a midwife and obstetrician approach a client from different perspectives. Especially in acute situations that demand quick decision-making, friction between professionals can be exacerbated. Such tensions may not only compromise the quality and efficiency of care but also cause distress for the client. Fostering effective collaboration between maternity care professionals, however, can help create a unified, patient-centered, and efficient system that ultimately leads to improved health outcomes for both mothers and children and better client experiences. While the differences in perspective are universal, the level and quality of collaboration between the different disciplines in the Netherlands does vary by region, with some areas fostering strong, respectful partnerships (10). Personal characteristics of individuals and bridging leadership seem to play an important role in this (7).

Standard practice in Dutch maternity care is generally as follows (6, 8, 9, 11). In early pregnancy (5-6 weeks) women register at a community midwife who establishes whether the pregnancy is low-risk or high-risk using the "List of Obstetric Indications" (LOI) at the first consultation (around 8-10 weeks of pregnancy) (8). The LOI is used by the midwife to designate the most appropriate care provider for women based on defined medical or obstetric conditions. Low-risk pregnant women are cared for by a community midwife, who is usually self-employed. At the onset of labor, these women are attended by their community midwife and have the choice to give birth at home, in a birth center or as an outpatient in a hospital (still under the care and responsibility of the midwife). If the pregnancy is categorized as high-risk, women are referred to a hospital to receive care from an obstetrician. Categorization as high-risk can occur at the beginning of pregnancy, but may also happen later in pregnancy, during delivery or postpartum (12). After giving birth in the hospital, women usually stay there for a short period of time (a few hours or days). At home, women and their babies are supported by a community midwife and a postpartum care assistant during labor and the postpartum period. The postpartum care assistant helps parents with the care for their baby and with light domestic work during the first eight days after giving birth (6, 8, 9, 11). Maternity care clients are required to pay a personal contribution for giving birth in a hospital without a medical indication, as well as for receiving postpartum care at home.

Textbox 1 provides an overview of health insurance and market dynamics within the Dutch health care system, highlighting key elements of the broader context in which Dutch maternity care operates.

**Textbox 1: Health insurance and market dynamics in the Dutch health care system**

In 2006, managed competition was introduced to strengthen market mechanisms within the health care system, resulting in three interrelated markets (see Figure below) (13-15). A key element of this reform was the new health insurance system established under the Health Insurance Act (Dutch abbreviation: Zvw).

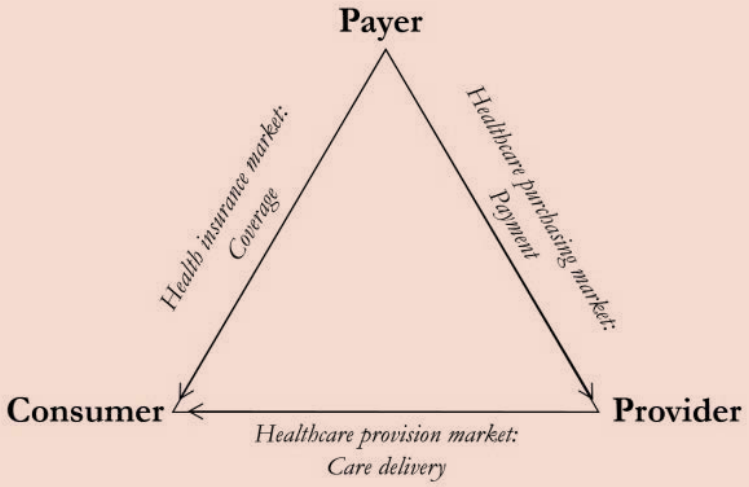



**Figure:** Interactions between consumer, provider and payer in the three markets in Dutch health care (from (16)).

First, on the health insurance market, citizens (consumers) interact with health insurers (payers). Every citizen is obliged to take up basic health insurance. All health insurers are obliged to offer a fixed package of basic health insurance coverage (annually determined by the Minister of Health, Welfare and Sport) and are not allowed to deny anyone for this basic health insurance package. Health insurers can compete with each other in terms of price for the basic health insurance package, but prices may not differentiate between consumers of one health insurer. Citizens are free to choose from which health insurer they want to buy

their basic health insurance package each year. Part of the expenses of the mandatory health insurance is covered by the premiums paid by consumers/citizens and the other part is covered through centrally collected income-related taxes which are redistributed to health insurers as risk-adjusted capitation payments, as part of the risk equalization system (13).

Second, on the health care purchasing market, payers and providers negotiate to determine the price, quality, and availability of medical services (13, 17). Health insurers contract hospitals, general practitioners, and specialized care providers, setting reimbursement rates and quality requirements. These contracts can be selective, meaning insurers may only work with certain providers to optimize efficiency and cost-effectiveness (17). Providers must meet insurer-set conditions to secure funding, while insurers seek to balance affordability with quality. Managed competition gives health insurers the incentives and tools to act as proactive buyers and to steer the providers they contract towards providing high quality care for a reasonable price.

Third, on the health care provision market, providers interact with consumers. Consumers (patients) may receive care from a range of providers, including general practitioners (GPs), hospitals and specialists. GPs act as gatekeepers, referring patients to specialized care only when necessary (13). Consumers have free choice of GP and can access specialized care based on referrals, but the extent of provider choice depends on their insurance policy. Providers must meet strict quality and safety standards set by regulatory bodies. Patient satisfaction, treatment outcomes, and waiting times may influence provider reputation and consumer demand, providers compete with each other on this (18).

The Dutch Healthcare Authority (Dutch abbreviation: NZa) acts as a regulator and keeps oversight, ensuring that the health insurance market, health care provision market and health care purchasing market all function appropriately and are in line with the Dutch system goals of quality, accessibility and affordability (19, 20). The Dutch Authority for Consumers and Markets (Dutch abbreviation: ACM) enforces antitrust laws among insurers and providers (21). The National Health Care Institute (Dutch translation: Zorginstituut Nederland) is an independent

administrative body that advises on which types of care should be included in the basic health insurance package, monitors the quality and efficiency of care, and contributes to a fairly functioning health insurance system (22). The Health and Youth Care Inspectorate (Dutch abbreviation: IGJ) is the regulatory authority responsible for overseeing the quality, safety, and accessibility of health care, medical products, and youth care (23). The IGJ monitors individual providers and professionals, and enforces compliance when necessary. In addition, the IGJ identifies structural problems and systemic risks within the health care system and advises the Ministry of Health, Welfare and Sport on improvements to legislation and regulations.

Traditionally, all maternity care providers have individual contracts with health insurers. For midwifery care and postpartum care at home, the Dutch Healthcare Authority defines the care products (covering one or more care services) that can be claimed and determines maximum tariffs for these products (24). Hospitals can freely negotiate tariffs with health insurers. Maternity care providers are generally paid for individual care services, or a few services combined into one claim. Only for midwifery care, a more extensive, pre-defined package with a predetermined tariff has been established for comprehensive prenatal care, which bundles multiple consultations and examinations into a single claim (25). This traditional payment model is commonly referred to in Dutch maternity care as the ‘monodisciplinary’ payment model, which illustrates how the various disciplines are completely separated in the system. It has been confirmed by policymakers and providers in Dutch maternity care that this monodisciplinary model hinders collaboration and task shifting and does not stimulate or enable integrated maternity care, which is believed to be needed to improve maternity care quality in the Netherlands (26). While the monodisciplinary model reduces undertreatment risks, it reinforces siloed working practices and organizational self-interest. The lack of financial incentives for joint investments, such as an integrated patient record, hinders efficient communication. Task shifting, like delegating certain obstetric procedures to community midwives, is financially discouraged in the traditional model as shifting care also shifts revenue. Health insurers struggle to promote substitution due to the rigid and fragmented payment system. Where task shifting does occur, reimbursement for delivered care often falls behind (5).

Health economic theory suggests that financial incentives play a crucial role in encouraging or discouraging collaboration and coordination among care providers (26-28). While the traditional, monodisciplinary (or fee-for-service) payment model incentivizes quantity over quality, and discourages collaboration; alternative payment models align financial incentives with quality and care coordination, motivating providers to work together to improve patient outcomes and contain spending. Consequently, payment reform was considered as a potential solution to improve the quality of maternity care in the Netherlands through strengthened collaboration (26).

To provide important context for the payment reform in Dutch maternity care, and the objectives of this thesis, theoretical considerations regarding alternative payment models and payment reform will be outlined in the next part of this introduction. The following page also provides definitions of several key terms central to this thesis.

## Definitions of key terms as used in this thesis

1. **Bundled payments/bundled payment model:** these two terms are both used in this thesis to refer to the bundled payment model. Either the specific bundled payment model for maternity care in the Netherlands or bundled payment models in general.
   *A bundled payment model is a reimbursement approach in which a payment is made for all services related to a defined episode of care (such as a surgery, treatment period, or condition-specific episode). Instead of paying separate providers or services individually, the model groups them into one 'bundle', creating shared financial accountability for spending and quality across all involved providers.*
2. **Alternative payment models (APMs):** refers to a group of payment models that differ from traditional fee-for-service and aim to improve collaboration, quality, or efficiency. In this thesis it is used as an overarching term to refer to several new payment models, including but not limited to bundled payments.
3. **Payment reform:** is used to refer to the broader process of redesigning and transitioning to a new payment model to achieve goals such as improved collaboration, quality, or efficiency.

# Theoretical considerations

## Shifting financial risk and accountability from payers to providers to align incentives with system goals

The fee-for-service (FFS) payment model, in which individual care providers are reimbursed for each individual service they provide, is the traditional and dominant payment model in health care. The FFS model has been scrutinized in academic literature over the last decades. Robinson (2001) critiques FFS for its inherent flaws, particularly its tendency to incentivize quantity over quality, leading to potential overutilization of services and escalating health care expenditures (27). Similarly, Miller (2009) argues that FFS structures often fail to promote coordinated care, as providers are compensated separately and for discrete services rather than patient outcomes, thereby discouraging integrated and efficient care delivery (28).

Both Robinson and Miller advocate for alternative payment models (APMs) that align financial incentives with the provision of high-quality, patient-centered care (27, 28). Payment reform in health care refers to the shift from FFS models to APMs that aim to improve the quality, efficiency, and value of care (29). APMs incentivize providers to focus on outcomes and cost-effective care rather than the volume of services delivered. Within FFS models, payers bear most financial risks with respect to the number of patients and their care utilization (Figure 1), while providers are in a better position to assess the care need and have a bigger influence on care utilization (28, 30). The concept of 'information asymmetry' refers to this imbalance in the amount of information available to providers (who have more) and payers (who have less), combined with the disproportionate distribution of risk and accountability, where payers bear more risk than providers (31). This information asymmetry between payers and providers can create an incentive for providers to provide more care than medically necessary, particularly when providers are reimbursed under a FFS model. Within APMs, a part of the financial risk and accountability is shifted from the payer towards providers (30). By shifting more risk towards providers, information asymmetry between payers and providers can be reduced, as the amount of risk one party bears is more balanced with the amount of information that party has. When providers bear financial risk for unnecessary services or complications, they have a stronger incentive to not only deliver appropriate care in coordination with other involved providers, but also to share accurate, relevant information with payers which improves transparency and reduces information asymmetry (27, 30). Risk and

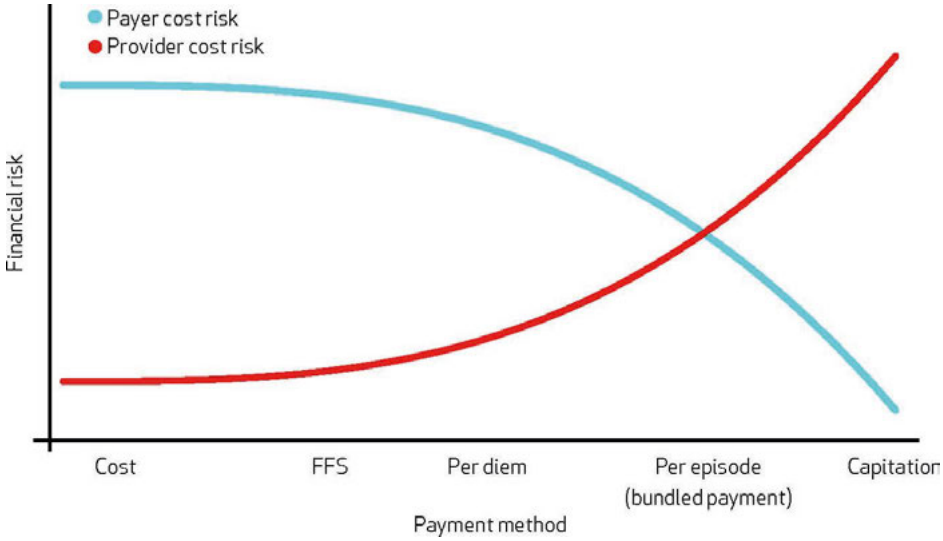



**Figure 1.** Amount of financial risk for providers and payers per payment model (30)

accountability, in the context of APMs, are closely linked but distinct concepts. Assuming risk creates the basis for accountability: by accepting financial risk, providers are responsible for delivering efficient, high-quality care and are held accountable if they fail to do so. In other words, risk drives accountability by giving providers a tangible incentive to perform well, while accountability enforces transparency and responsibility in how providers manage that risk.

With regards to the amount and type of risk that is shifted from payers to providers under APMs, there is broad consensus on a few key principles (30). First off, it is important to make a distinction between insurance risk and performance risk. Insurance risk refers to the random variation in health care spending from outlier patients and is typically borne by health insurers (30, 33). Performance risk refers to the variation in health care spending that is dependent on the performance of providers, and can be influenced by the skills and choices of providers (30, 33). The first principle, when shifting risk to providers, entails that individual providers should not bear insurance risk, as this cannot be affected by providers. Second, APMs can drive system improvements by encouraging providers to innovate when they face appropriate levels of performance risk. However, third, excessive performance risk can result in negative outcomes, such as the overuse or underuse of care and potential access issues if key providers are driven out of business. Thus,

when shifting risk to providers, placing insurance risk on providers should be avoided while ensuring the right balance of performance risk to reduce information asymmetry and encourage health care transformation without creating harmful side effects (30).

## Different types and categories of APMs

The Health Care Payment Learning & Action Network (HCPLAN) created the APM Framework (Figure 2) to categorize and advance value-based payment models (29). The framework is divided into four categories, each representing a step toward greater accountability for quality, spending and population health. Category 1 is the traditional FFS model with no link to quality. This model incentivizes volume over value, as payment is based solely on the quantity of services rendered. There is no financial motivation for providers to coordinate care or focus on efficiency, which can contribute to unnecessary treatments and rising health care spending. Category 2 (FFS with a link to quality) begins to introduce quality considerations. While providers are still paid per service, this model incorporates performance-based incentives or penalties tied to specific quality measures. These measures may include patient satisfaction scores, adherence to clinical guidelines, or reductions in avoidable hospital readmissions. An example of a common APM in this category is the pay-for-performance (P4P) model. Category 3 (APMs built on FFS architecture) takes a significant step toward value-based care by incorporating financial accountability for both quality and spending. These models maintain the FFS foundation but add mechanisms such as shared savings or shared risk. Providers may be rewarded if they deliver care more efficiently than expected while maintaining quality standards, or they may be penalized if spending exceeds targets. Common examples include Accountable Care Organizations (ACOs) (in which groups of providers work collaboratively to manage patient care), and retrospective bundled payment models (where a single payment covers all services related to a specific episode of care, such as a joint replacement or pregnancy and delivery). Category 4 (population-based payment models) represents the most advanced stage of the framework, where payments are made on a per person basis rather than per service. Providers receive a fixed amount, typically per member per month, to manage the health of a defined population. APMs at this advanced stage promote integrated care, prevention, and health promotion. Examples of APMs in this category include prospective bundled payment models, capitation (where providers are paid a fixed amount per patient regardless of the number of services delivered) and global payments

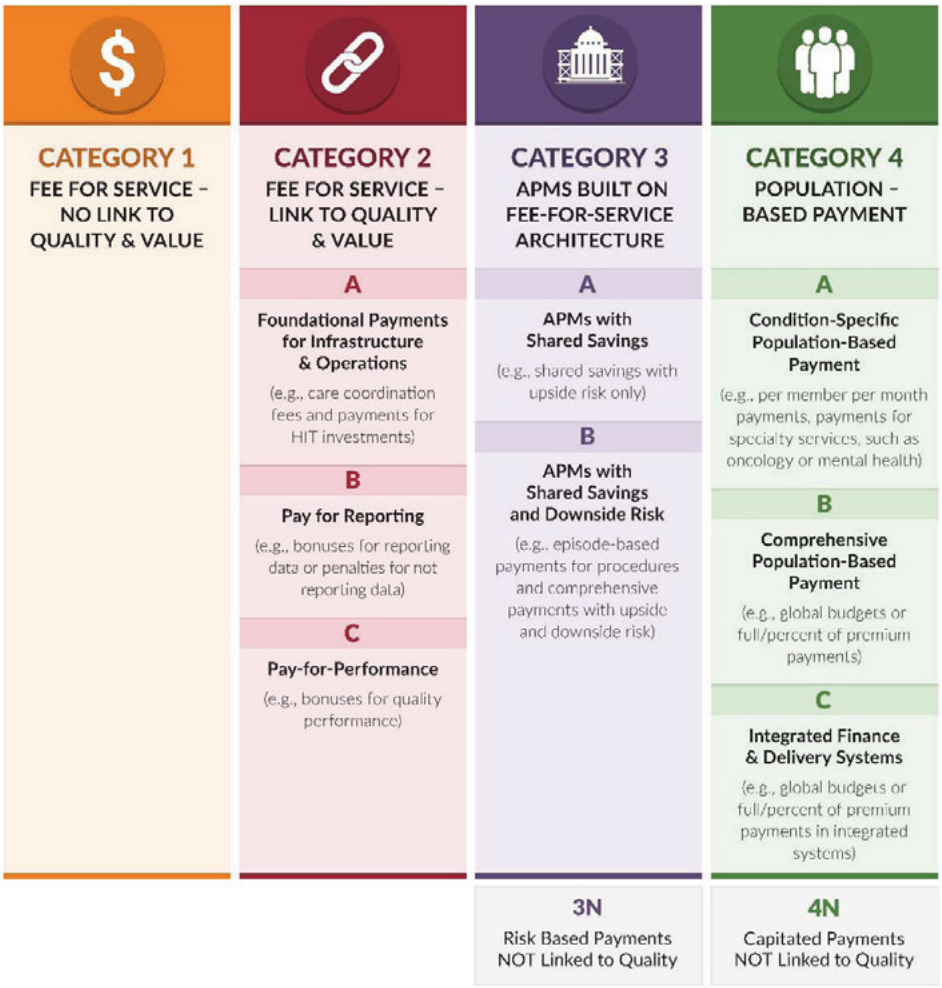



**Figure 2.** The HCPLAN APM-Framework (29)

(where fixed budgets are determined covering all patient care of a certain group or population).

## Bundled payment models

In order to achieve the desired changes in maternity care in the Netherlands (i.e., improving quality of care and health outcomes through intensified multidisciplinary collaboration and coordination) a bundled payment model seemed a good fit (26). The bundled payment model combines advanced value-based payment characteristics (needed to achieve the desired

changes) with an episode-of-care payment structure that fits well with the pregnancy and delivery care pathway in maternity care (29). HCPLAN categorizes bundled payments within both Category 3 (retrospective bundles) and Category 4 (prospective bundles), reflecting varying levels of provider accountability and financial risk. Bundled payments, in the view of HCPLAN, are not an end point but a stepping stone between FFS and broader value-based reforms and provider risk maturity, eventually leading to population-based payments (29).

Bundled payment models usually involve providers receiving a fee or budget for an episode of care (such as pregnancy and delivery), with providers typically sharing in any savings or losses incurred within the scope of the bundle. Retrospective bundled payments retain the FFS billing structure, and at the end of the defined episode of care actual spending is compared to a predetermined target price for the bundle. Providers then share in respective savings or losses. Within prospective bundled payments, providers are paid up front for the entire episode of care and are responsible for delivering all necessary care within that payment. The key difference between retrospective and prospective bundled payments lies in the timing of the payment and who bears the financial risk up front. The theory of bundled payment models is based on the notion that providers are best positioned to deliver higher-value care and reduce the use of lower-value services, and that bearing financial risk will incentivize providers to do so as they are motivated to contain spending under the bundled payment (28, 30, 32, 33). Achieving spending growth reduction, ideally with improved health or no detrimental effects on health, could make the health care system more efficient and sustainable and would support transitions toward integrated and value-based care.

While bundled payments are designed to generate improvements, they can also produce unintended consequences, which we divided into two categories for the purpose of this thesis: 1) side effects (i.e., unintended but generally acceptable); and 2) adverse consequences (i.e., unintended and unacceptable). An example of the first category can be the significant administrative burden in the early years of implementation. Examples of more serious adverse consequences in the second category are risk selection, undersupply of necessary care and strategic upcoding (34). Risk selection occurs when providers avoid high-risk patients to minimize financial losses. Additionally, pressures to contain spending, as a consequence of

providers bearing too much performance risk, could lead to an undersupply of necessary services, potentially compromising care quality. Providers may also engage in strategic coding practices to maximize reimbursements rather than genuinely improving efficiency. Furthermore, it should be noted that achieving consistent spending growth reductions and quality improvements under bundled payments is not guaranteed as many factors play into this (e.g., setting appropriate bundle prices). In addition to the potential unintended consequences derived from theory, stakeholders in practice may be apprehensive of other unintended consequences as well. For example in maternity care in the Netherlands, some stakeholders are concerned that the introduction of bundled payments will lead to reduced autonomy for individual professionals, less freedom of choice for clients, and increased medicalization (35). It is important to take into account the full range of possible unintended consequences when considering the implementation of bundled payments.

## Design and implementation of APMs

The design and implementation of APMs in practice is a challenging and complex process in which multiple factors are at play. Conrad et al. (2016) provide a comprehensive framework (Figure 3) for understanding, designing and implementing APMs, taking these various factors into account (36). Their framework consists of key factors that influence the success of APMs and illustrates how context, objectives, reform strategy, and the barriers and facilitators to translating strategy into practice affect APM implementation and outcomes. More specifically, it shows how contextual factors (e.g., the health care system's structure, regulatory environment, market conditions, stakeholder characteristics) affect both the objectives of the APM (e.g., reducing unnecessary care, improving care coordination, enhancing patient outcomes, controlling spending) and the implementation of the APM; and how implementation is also influenced by the reform strategy (type of APM) and potential barriers (e.g., lack of interoperability in IT systems, provider resistance, administrative burdens, lack of trust (37)) and facilitators (e.g., strong leadership, supportive policy frameworks). Additionally, the framework emphasizes that the choice of a specific APM should be guided by the broader context and objectives of the reform. The impact of the APM implementation can be evaluated by assessing spending, quality, health care utilization, health outcomes, patient experiences, and provider behavior changes. Outcomes of these evaluations should inform the next cycle of policy decisions to support and improve the APM implementation according to Conrad et al. (36).

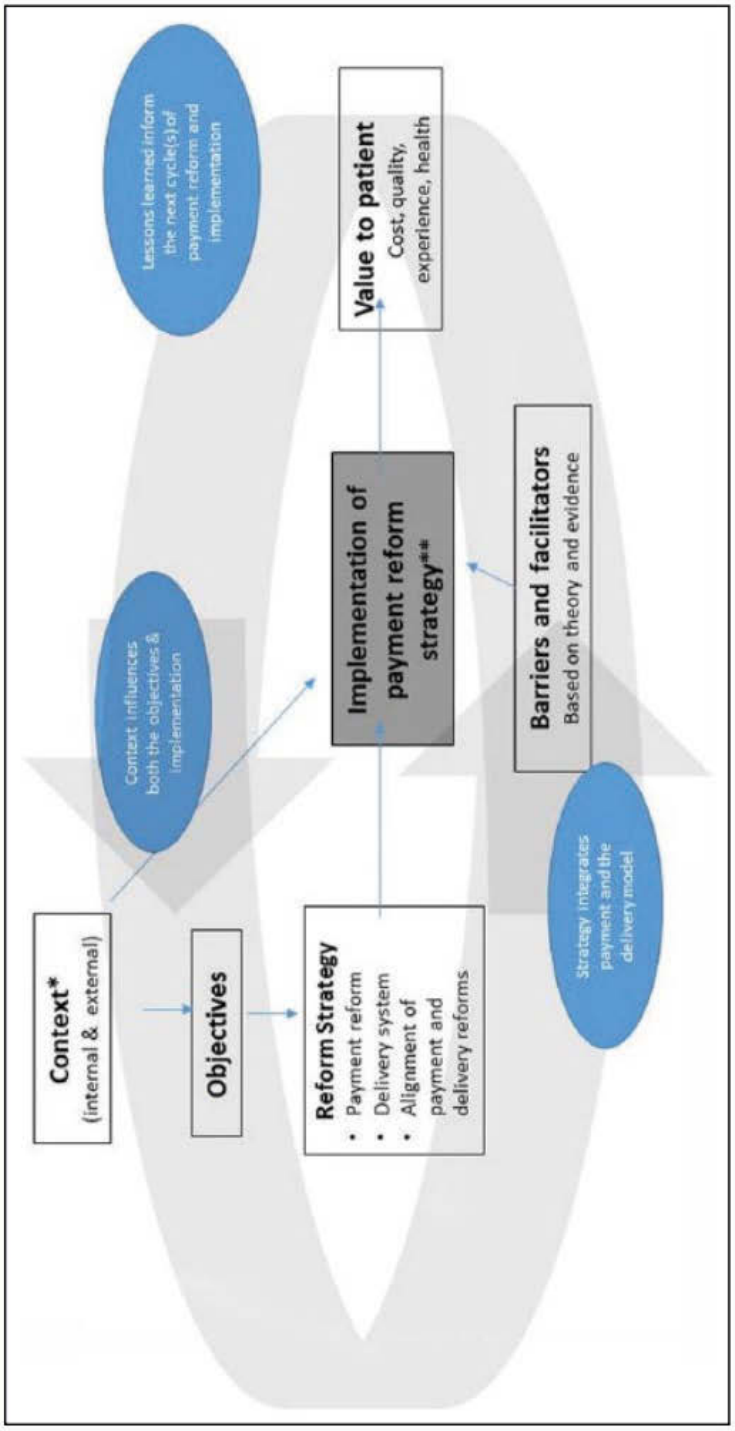



**Figure 3.** Conceptual framework for implementing value-based payment reform (36)

## Bundled payment models in practice

Bundled payment models have been implemented in various health care settings and countries during the past twenty-five years. As of 2020, a study by Struijs et al. (32) identified 23 bundled payment initiatives across eight high-income countries, with the majority implemented in the United States (e.g., the PROMETHEUS and Bundled Payments for Care Improvement (BPCI) initiatives) (38-42). Other countries with bundled payment initiatives include Taiwan, England, the Netherlands, Portugal, Denmark, New Zealand, and Sweden (43-50). Most of these bundled payment models focus on one condition or treatment (e.g., diabetes, breast cancer, total joint replacement) and started off as pilots or experiments.

Struijs et al. provide an overview of the available empirical evidence on these bundled payment initiatives (32). In total, 35 papers were examined assessing 11 of the initiatives, primarily from the United States, with a focus on the BPCI program. The evaluations in these papers predominantly employed observational designs, applying methodologies like pre- and post-measurements without control groups or difference-in-differences (DiD) analyses. Approximately 60% of the studies (20 out of 32 studies evaluating spending) reported reductions in medical spending or slower spending growth associated with bundled payment models. The extent of spending growth reductions varied significantly across studies. For instance, Sweden's bundled payment model for total hip and knee replacements resulted in a 34% decrease in average total medical spending, whereas a U.S. initiative targeting chronic obstructive pulmonary disease (COPD) in Medicare patients achieved a 4.3% spending reduction compared to BPCI target prices. Notably, the Dutch bundled payment model for diabetes care observed an increase in total medical spending during its initial two years, with no data available for the years after this initial period. Out of 32 studies evaluating quality of care, 18 reported modest improvements, while 12 found no significant changes. Two studies indicated negative effects on quality. Patient experiences were infrequently evaluated in the available studies. In summary, the available empirical evidence suggests that bundled payment models can lead to savings or spending growth reductions and, in some cases, modest improvements in care quality. However, the findings are mixed, and further research is needed to fully understand the impact of bundled payment models in practice (32).

Also in maternity care there is a growing adoption of alternative payment models in various countries. Eighteen APM initiatives have been implemented

in maternity care (outside of the Netherlands) thus far: 14 in the United States, two in the United Kingdom, one in New Zealand, and one in Australia (51). These initiatives employed three types of APMs: pay-for-performance (2), shared savings (7) and bundled payments (9). Empirical evidence on the effects of these APMs remains scarce in maternity care with only four empirical studies evaluating their effects published to date (51). Two studies reported associations between APMs and improvements in specific health outcomes (52, 53). Two other studies observed reductions in medical spending (54, 55). The two studies (of these four) that focused particularly on the evaluation of a bundled payment model reported a reduction in neonatal intensive care unit (NICU) admissions and increased screening and prevention activities in one study, and reduced spending and no changes in health in the other study (53, 55). Overall, the limited evidence suggests that APMs in maternity care may lead to savings or spending growth reductions, and some improvements in care, though findings remain mixed and context dependent. Notably, all four studies evaluating APMs in maternity care thus far were conducted in the United States, highlighting the need for further research on maternity care APMs in other health care systems and settings.

## The experiment with bundled payments in maternity care

In the years following the European Perinatal Health Report of 2008 and the report by the Dutch Steering Committee on Pregnancy and Childbirth in 2009 (2, 4), the details of a bundled payment model for maternity care were explored further (26). Although plans to implement the bundled payment model began as early as 2013, the experiment did not officially start until 2017 (56). The primary reason for this delay was the strong pushback from various stakeholders against the proposed plans to implement bundled payments for maternity care on a national level. This resistance was driven by a fear that the bundled payment model would restrict autonomy of individual care professionals, limit freedom of choice for clients, increase medicalization and eventually lead to phasing out of home births and independent midwives within Dutch maternity care (5, 26, 35, 57). Eventually, the Ministry of Health, Welfare and Sport decided to start an experiment with bundled payments in maternity care, on a voluntary basis. At the start of the experiment in 2017, six regions in the Netherlands voluntarily adopted the bundled payment model for maternity care.

Adoption of the bundled payment model requires the establishment of a new provider-led, legal entity, the integrated maternity care organization (IMCO), in which several maternity care providers (e.g., midwives, obstetricians, a hospital, and postpartum care providers) are united (57). The IMCO negotiates contracts with health insurers and subsequently subcontracts the participating providers to provide the contracted care (Figure 4). The IMCO itself does not provide care but is merely an administrative organization uniting the different providers who do provide care. These providers are also the owners of the IMCO. IMCOs differ from traditional Maternity Care Networks (MCNs) in several ways. MCNs do not require a legal entity to be established and MCNs generally use the traditional, monodisciplinary payment model, making them a less binding organizational form compared to IMCOs (57). When an IMCO is established, the existing MCN in that region is typically (but not always) integrated into it. Both MCNs and IMCOs serve the same regions and populations.

Various versions of the bundled payment model for maternity care have been considered, including a model with two modules proposed by KPMG Plexus in 2016, at the request of the Ministry of Health, Welfare and Sport (56). KPMG Plexus advised to define the following two modules: one for miscarriages

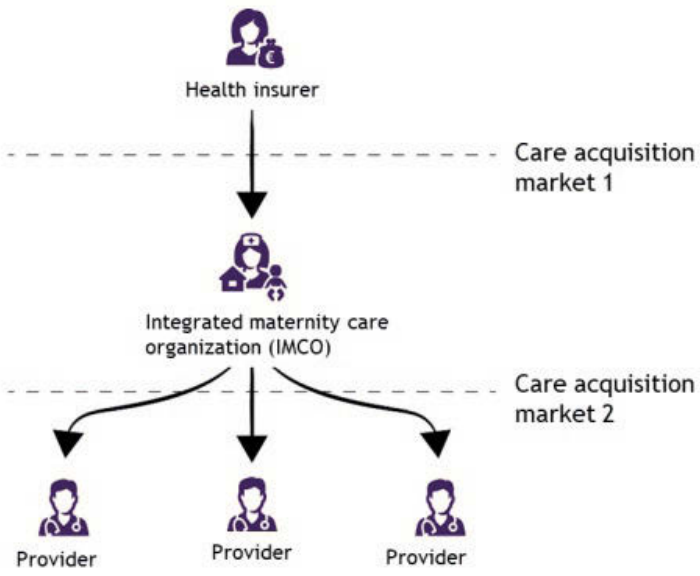



**Figure 4.** Visualization of the two health care purchasing markets after the introduction of the IMCO

(pregnancies up to and including 16 weeks) and one for pregnancies beyond 16 weeks. However, in April 2016, the Ministry came to an agreement with maternity care stakeholders to deviate from the KPMG Plexus advice and increase the number of modules in the bundled payment model as stakeholders considered the two-module option too loosely structured and therefore too risky (58, 59). This is consistent with the general perception that setting an appropriate price for a bundle with a broad scope is often considered challenging and therefore risky.

The definitive bundled payment model that was designed for the 2017 experiment includes all prenatal, natal, and postnatal care services delivered by midwives, obstetricians, and postpartum care providers (57). A price distinction is made between regular and complex care. Care for the newborn, outside of standard postpartum care, is not included in the bundle. The payment model is organized into nine modules (Figure 5). Depending on the pregnancy duration, either one or four modules can be claimed. If the pregnancy ends before 16 weeks, only one module is claimed. For pregnancies lasting 16 weeks or longer, four modules are claimed: one each for the prenatal, natal, and postnatal phases, as well as one for postpartum care at home. For the prenatal, natal, and postnatal stages, either the regular or complex module is selected based on the required level of care (57). The ninth module for postpartum care at home is reimbursed per hour of care provided, which is in contrast with the intended, integrated character of the bundled payment model. IMCOs also receive additional 'overhead' funding from health insurers as an add-on to all claims. This overhead funding supports the establishment of the organization, the development of a new governance-structure, and the ongoing management of the IMCO. These are new and additional expenses due to the implementation of the bundled payment model and the subsequent establishment of a new legal entity.

Prices of the modules are freely negotiated between the IMCO and the health insurers, resulting in variations across different IMCOs and insurers. Typically, IMCOs negotiate prices with the dominant health insurer in their region (i.e., the insurer with the largest market share). Other insurers generally adopt the agreed-upon prices, provided they do not differ by more than +/- 10% from their own rates. This was agreed upon by health insurers nationally to facilitate the contract negotiation process and reduce the administrative burden, and is called 'follower policy' (in Dutch: volgbeleid). In addition to this, health insurers can also negotiate multiyear contracts with IMCOs.

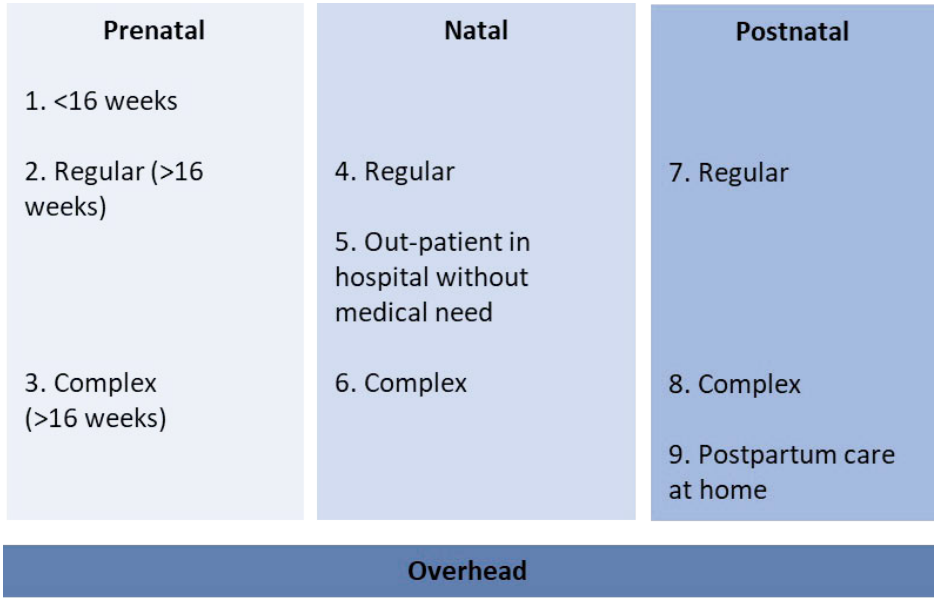



**Figure 5.** Design of the bundled payment model for maternity care in nine modules

## Research gap

Evaluation research on APMs generally falls into two categories: 1) impact evaluations, which assess whether APMs achieve intended outcomes such as improved care quality at constant or reduced spending growth, and 2) evaluations of development and implementation, which explore facilitators and barriers that influence the success of APMs and help contextualize impact findings (60).

A comprehensive evaluation of an APM requires the integration of multiple methods applied at different stages. Qualitative methods are particularly valuable during the implementation phase for process evaluations, while quantitative methods are more suited to impact evaluations conducted several years post-implementation. Stakeholders may value findings differently: some prioritize the objectivity of quantitative data, while others appreciate the contextual insights offered by qualitative research. Regardless of the methods used, involving stakeholders throughout the development, implementation, and evaluation processes is crucial. Not only for gathering relevant input from different perspectives but also for building support for the APM.

A variety of qualitative and quantitative methods can be used in APM evaluations. Qualitative techniques - such as interviews and focus groups - are well-suited to explore the complexity and context of APMs during development and implementation. Quantitative methods - including pre-post designs, regression analysis, interrupted time series, and in particular the quasi-experimental DiD design - are useful to estimate causal effects on outcomes such as health, care quality, spending, or utilization (61, 62). Qualitative methods can also be helpful for appropriately interpreting quantitative findings.

Currently, most evaluations predominantly rely on quantitative, observational designs, often employing methods like pre- and post-measurements without control groups or DiD analyses (32). Although qualitative research is also conducted, it is less common, and studies employing more alternative approaches such as Q-methodology remain rare (63, 64). While such methods can offer valuable insights into the diverse perspectives of stakeholders and enrich the overall understanding of APMs. Moreover, existing quantitative studies often focus on a limited set of outcomes due to restricted data availability, and they rarely include measures of patient experience or potential unintended consequences.

An important development for evaluations of APMs is the increased availability of routinely collected observational data. Traditionally, randomized controlled trials (RCTs) have always been the gold standard for health research due to their ability to control treatment conditions and maximize internal validity (65, 66). However, they often lack generalizability to real-world settings, particularly in complex settings such as payment reforms and other health policy interventions. Observational studies, although methodologically challenging due to less controlled conditions and a higher risk of confounding, can complement RCTs by providing real-world insights with greater external validity (67-69). Studies using observational data allow for the study of complex interventions where RCTs are impractical or unethical (70). Additionally, using existing observational data is cost- and time-efficient and in line with FAIR data principles (Findable, Accessible, Interoperable, Reusable), reducing administrative burdens (71). Recent advancements in methodologies and data collection have also addressed some of the challenges of observational data, such as limited sample diversity, incomplete datasets and a lack of

appropriate methods for causal inference. There is growing recognition of the need for comprehensive, population-based data registers that include data on health outcomes, health care use, quality measures, spending and social determinants of health; in combination with the use and continued improvement of quasi-experimental methods such as DiD analysis for causal inference. However, it remains crucial to complement these observational studies with qualitative research that 1) includes aspects often lacking from observational data (such as the perspectives of providers, and the patient experience), and 2) helps contextualize and interpret the quantitative findings correctly.

Finally, it is essential to structure APM evaluations in a way that captures all relevant dimensions of the payment reform. Frameworks such as the one proposed by Conrad et al. (2016) can support a more comprehensive approach by highlighting the importance of aligning evaluation efforts with the broader objectives, strategies, and contextual conditions of the APM (36). Integrating such a framework into the evaluation design helps ensure that findings are not only robust and explanatory, but also actionable, thereby supporting the continuous improvement and adaptation of the APM over time.

In summary, we can conclude that while some evidence on APMs, and bundled payment models in particular, exists, significant gaps remain. Additional research is needed to validate the effectiveness of APMs across different settings (e.g., different countries, different health systems, different health care sectors) and provide more insights into the different perspectives of various stakeholders (e.g., policymakers, payers, providers, professionals and patients/clients) on APMs. Aside from studying potential positive effects, it is also important to include unintended consequences in evaluations of APMs. Both to ensure that no adverse effects arise as a consequence of the payment reform, and to acknowledge and address concerns that stakeholders may have. More studies employing qualitative and alternative methods are needed to enrich the overall understanding of APMs, and clients should be more involved in these evaluations. Quantitative evaluations of APMs remain important to conduct alongside qualitative studies, and should make use of existing observational data sources including a wide variety of relevant outcomes, and the latest techniques for causal inference.

## Objective of this thesis

The main objective of this thesis is to evaluate the bundled payment model for maternity care and to provide relevant insights for payment reform in maternity care. In particular, the focus will be on answering the following questions: 1) how can we apply observational data to evaluate the bundled payment model for maternity care?; 2) what is the impact of the bundled payment model for maternity care on health outcomes of mothers and children, maternity care utilization, and maternity care spending?; and 3) what are the different perspectives of stakeholders on the bundled payment model for maternity care?.

## Thesis outline

### Part I: Observational Data and Effect Evaluation

*Chapters 2 and 3 will focus on research question 1 (how can we apply observational data to evaluate the bundled payment model for maternity care?) and 2 (what is the impact of the bundled payment model for maternity care on health outcomes of mothers and children, maternity care utilization, and maternity care spending?).*

**Chapter 2** focuses on the potentials and challenges when using observational data for integrated maternity care and payment reform research, based on our experience from developing and working with the Data-InfrAstructure for ParEnts and childRen (DIAPER). Several applications of DIAPER are described to illustrate its wide-ranging opportunities and serve as an example for other researchers on the use and value of routinely collected, observational data for the evaluation of health policy interventions.

In **Chapter 3**, we studied the impact of the bundled payment model for maternity care in the Netherlands on health outcomes of mothers and children, maternity care utilization and maternity care spending through its first two years, studying the six regions that adopted the model in 2017. We applied a quasi-experimental, difference-in-differences approach to assess the effects of the bundled payment model.

## Part II: Stakeholder Perspectives

*Chapters 4 and 5 will focus on research question 3 (what are the different perspectives of stakeholders on the bundled payment model for maternity care?).*

**Chapter 4** describes the Q-methodological study we performed to explore perspectives on payment reform of stakeholders in maternity care in the Netherlands. The framework by Conrad et al. (36) was used in this study to develop a comprehensive and balanced statement set, enabling all participants to fully express their perspective. This study provides a deeper understanding of stakeholders' perspectives on payment reform in maternity care and provides relevant insights into the obstacles to implementing APMs and potential ways forward.

To improve evaluations of APMs that can better support policy decisions in the future, it is essential to more thoroughly and comprehensively identify the key themes to include in evaluations of APMs. In **Chapter 5**, we conduct an initial exploration of the themes that are important to maternity care clients and should therefore be included in evaluations of payment reform in maternity care. To this end, we performed a qualitative study and conducted in-depth interviews with maternity care clients, in a region that adopted the bundled payment model, to identify the key themes from the client perspective. The framework by Conrad et al. (36) was used in this study to construct the topic list for the semi-structured interviews and as a base for the coding system for the analysis.

**Chapter 6** summarizes and integrates the main findings of the individual chapters and answers how observational data can be applied to evaluate the bundled payment model, what the impact is of the bundled payment model on various outcomes, and what the different perspectives of stakeholders entail. Subsequently, reflections on the main findings are provided. The chapter continues with a discussion of methodological considerations and suggestions for future research, followed by implications for policy and practice, and ends with concluding remarks.

## Thesis context

This thesis is part of the monitor by the National Institute for Public Health and the Environment (Dutch abbreviation: RIVM) on payment reform in maternity care, and is funded by the Dutch Ministry of Health, Welfare and Sport (Dutch abbreviation: VWS). This thesis functions as the scientific basis of the RIVM-monitor. The RIVM is an independent knowledge institute conducting research on topics relating to the environment, infectious diseases, lifestyle and health care for various commissioning partners. The institute is an agency of the Ministry of Health, Welfare and Sport.

## References


1. Zeitlin J, Mohangoo A, Cuttini M. The European Perinatal Health Report: comparing the health and care of pregnant women and newborn babies in Europe. *BMJ Publ Group Ltd.* 2009;681–2.
2. EuroPeristat. European Perinatal Health Report. 2008.
3. Sheldon T. Perinatal mortality in Netherlands third worst in Europe. *BMJ Publ Group.* 2008.
4. Steering Committee on Pregnancy and Childbirth. A good start. 2009. [in Dutch]
5. National Institute for Public Health and the Environment. Maternity care in the picture. 2018. [in Dutch]
6. Perdok H, Jans S, Verhoeven C, Henneman L, Wiegers T, Mol BW, et al. Opinions of maternity care professionals and other stakeholders about integration of maternity care: a qualitative study in the Netherlands. *BMC Pregnancy Childbirth*. 2016;16:1–12.
7. Boesveld IC, Valentijn PP, Hitzert M, Hermus MA, Franx A, De Vries RG, et al. An approach to measuring integrated care within a maternity care system: experiences from the maternity care network study and the Dutch birth Centre study. *Int J Integr Care*. 2017;17(2):1–13.
8. Amelink-Verburg MP, Buitendijk SE. Pregnancy and labour in the Dutch maternity care system: what is normal? The role division between midwives and obstetricians. *J Midwifery Womens Health*. 2010;55(3):216–25.
9. Perdok H, Jans S, Verhoeven C, van Dillen J, Batenburg R, Mol BW, et al. Opinions of professionals about integrating midwife- and obstetrician-led care in The Netherlands. *Midwifery.* 2016;37:9–18.
10. Cronie D, Rijnders M, Jans S, Verhoeven CJ, de Vries R. How good is collaboration between maternity service providers in the Netherlands? *J Multidiscip Healthc*. 2018:21–30.
11. van Manen EL, Hollander M, Feijen-de Jong E, de Jonge A, Verhoeven C, Gitsels J. Experiences of Dutch maternity care professionals during the first wave of COVID-19 in a community based maternity care system. *PLoS One*. 2021;16(6):e0252735.
12. Wiegers TA, de Borst J. Organisation of emergency transfer in maternity care in the Netherlands. *Midwifery.* 2013;29(8):973–80.
13. Schut FT, Varkevisser M. Competition policy for health care provision in the Netherlands. *Health Policy.* 2017;121(2):126–33.
14. Maarse H, Bartholomée Y. A public–private analysis of the new Dutch health insurance system. *Eur J Health Econ.* 2007;8:77–82.
15. Van de Ven WP, Schut FT. Universal mandatory health insurance in the Netherlands: a model for the United States? *Health Aff (Millwood).* 2008;27(3):771–81.
16. Cattel D. Getting the incentives right: The design of value-based consumer and provider payments in health care. Erasmus University Rotterdam; 2021.
17. Jeurissen P, Maarse H. The market reform in Dutch health care. Results, lessons and prospects. *European Observatory on Health Systems and Policies.* 2021.

18. Maarse H, Jeurissen P, Ruwaard D. Results of the market-oriented reform in the Netherlands: a review. *Health Econ Policy Law*. 2016;11(2):161–78.
19. Dutch Healthcare Authority. Mission 2025. 2025. Available from: https://www.nza.nl/english
20. Dutch Healthcare Authority. Information sheet: Role and responsibilities of the Dutch Healthcare Authority. 2019. [in Dutch]
21. Wammes J, Jeurissen P, Westert G, Tanke M. The Dutch health care system. *Int Profiles Health Care Syst*. 2020;137(6).
22. Dutch Health Care Institute. About Us. 2025. Available from: https://www.zorginstituutnederland.nl/over-ons. [in Dutch]
23. Health and Youth Care Inspectorate. About Us. 2025. Available from: https://english.igj.nl/about-us
24. Dutch Healthcare Authority. Registration and claiming in maternity care. 2025. Available from: https://www.nza.nl/zorgsectoren/geboortezorg/registreren-en-declareren. [in Dutch]
25. Dutch Healthcare Authority. Product and tariff decision for obstetric care TB-REG-25607-02. 2024. [in Dutch]
26. Dutch Healthcare Authority. Advice on the payment model of (integrated) care around pregnancy and childbirth. 2012. [in Dutch]
27. Robinson JC. Theory and practice in the design of physician payment incentives. *Milbank Q*. 2001.
28. Miller HD. From volume to value: better ways to pay for health care. *Health Aff (Millwood)*. 2009;28(5):1418–28.
29. HCP-LAN. APM Framework. 2017.
30. Frakt AB, Mayes R. Beyond capitation: how new payment experiments seek to find the 'sweet spot' in amount of risk providers and payers bear. *Health Aff (Millwood)*. 2012;31(9):1951–8.
31. Arrow KJ. Uncertainty and the welfare economics of medical care. In: *Uncertainty in Economics*. Elsevier; 1978. p. 345–75.
32. Struijs JN, de Vries EF, Baan CA, van Gils PF, Rosenthal MB. Bundled-payment models around the world: how they work and what their impact has been. Commonwealth Fund. 2020.
33. Nijagal MA, Shah NT, Levin-Scherz J. Both patients and maternity care providers can benefit from payment reform: four steps to prepare. *Am J Obstet Gynecol*. 2018;218(4):411.e1–e6.
34. Squires D, Ba D. The promise and pitfalls of bundled payments. The Commonwealth Fund. 2016. Available from: https://www.commonwealthfund.org/blog/2016/promise-and-pitfalls-bundled-payments
35. National Institute for Public Health and the Environment. On the way to bundled payments for maternity care. 2016. [in Dutch]
36. Conrad DA, Vaughn M, Grembowski D, Marcus-Smith M. Implementing value-based payment reform: a conceptual framework and case examples. *Med Care Res Rev*. 2016;73(4):437–57.

37. de Vries EF, Drewes HW, Struijs JN, Heijink R, Baan CA. Barriers to payment reform: experiences from nine Dutch population health management sites. *Health Policy*. 2019;123(11):1100–7.
38. Hussey PS, Ridgely MS, Rosenthal MB. The PROMETHEUS bundled payment experiment: slow start shows problems in implementing new payment models. *Health Aff (Millwood)*. 2011;30(11):2116–24.
39. de Brantes F, Rosenthal MB, Painter M. Building a bridge from fragmentation to accountability—the Prometheus payment model. *N Engl J Med*. 2009;361(11):1033–6.
40. Centers for Medicare & Medicaid Services. Bundled Payments for Care Improvement Initiative (BPCI) Fact Sheet. 2016.
41. Rolnick JA, Liao JM, Emanuel EJ, Huang Q, Ma X, Shan EZ, et al. Spending and quality after three years of Medicare's bundled payments for medical conditions: quasi-experimental difference-in-differences study. *BMJ*. 2020;369:m1780.
42. Cassidy A. Bundled payments for care improvement initiative. Project HOPE; 2015.
43. Wang CJ, Cheng SH, Wu JY, Lin YP, Kao WH, Lin CL, et al. Association of a bundled-payment program with cost and outcomes in full-cycle breast cancer care. *JAMA Oncol*. 2017;3(3):327–34.
44. Henderson J. Maternity Pathway Bundled Payment. 2016.
45. Struijs JN, Baan CA. Integrating care through bundled payments—lessons from the Netherlands. *N Engl J Med*. 2011;364(11):990–1.
46. Ponce P, Marcelli D, Guerreiro A, Grassmann A, Gonçalves C, Scatizzi L, et al. Converting to a capitation system for dialysis payment–the Portuguese experience. *Blood Purif*. 2012;34(3–4):313–24.
47. Rocha MJ, Ferreira S, Martins LS, Almeida M, Dias L, Pedroso S, et al. Cost analysis of renal replacement therapy by transplant in a system of bundled payment of dialysis. *Clin Transplant*. 2012;26(4):529–31.
48. Rudkjøbing A, Vrangbaek K, Birk HO, Andersen JS, Krasnik A. Evaluation of a policy to strengthen case management and quality of diabetes care in general practice in Denmark. *Health Policy*. 2015;119(8):1023–30.
49. Grigg CP, Tracy SK, Tracy M, Daellenbach R, Kensington M, Monk A, et al. Evaluating maternity units: a prospective cohort study of freestanding midwife-led primary maternity units in New Zealand—clinical outcomes. *BMJ Open*. 2017;7(8):e016288.
50. Porter ME, Marks CM, Landman ZC. OrthoChoice: bundled payments in the county of Stockholm (B). *Harvard Bus Sch Suppl*. 2014:714–515.
51. De Vries EF, Scheefhals ZTM, de Bruin-Kooistra M, Baan CA, Struijs JN. A scoping review of alternative payment models in maternity care: insights in key design elements and effects on health and spending. *Int J Integr Care*. 2021;21(2):1–12.
52. Dahlen HM, McCullough JM, Fertig AR, Dowd BE, Riley WJ. Texas Medicaid payment reform: fewer early elective deliveries and increased gestational age and birthweight. *Health Aff (Millwood)*. 2017;36(3):460–7.
53. Berry SA, Laam LA, Wary AA, Mateer HO, Cassagnol HP, McKinley KE, et al. ProvenCare perinatal: a model for delivering evidence/guideline-based care for perinatal populations. *Jt Comm J Qual Patient Saf*. 2011;37(5):229–AP3.

54. Carroll C, Chernew M, Fendrick AM, Thompson J, Rose S. Effects of episode-based payment on health care spending and utilization: evidence from perinatal care in Arkansas. *J Health Econ*. 2018;61:47–62.
55. Kozhimannil KB, Graves AJ, Ecklund AM, Shah N, Aggarwal R, Snowden JM. Cesarean delivery rates and costs of childbirth in a state Medicaid program after implementation of a blended payment policy. *Med Care*. 2018;56(8):658–64.
56. KPMG Plexus. Advice on bundled payments for maternity care. 2016. [in Dutch]
57. National Institute for Public Health and the Environment. Bundled payments for maternity care: experiences after three years and the first visible effects. 2020. [in Dutch]
58. Dutch Healthcare Authority. Ruling on the Clara Wichmann Foundation's appeal. 2017. [in Dutch]
59. Ministry of Health, Welfare and Sport. Preliminary notification on bundled payments for maternity care. 2016. [in Dutch]
60. Hendriks C, Scheefhals ZTM, Gigengack T. Evaluating Alternative Payment Models in Healthcare: "A Specialised Field". *VGE Bulletin*. 2022; Fall 2022. [in Dutch]
61. Dimick JB, Ryan AM. Methods for evaluating changes in health care policy: the difference-in-differences approach. *JAMA*. 2014;312(22):2401–2.
62. Wing C, Simon K, Bello-Gomez RA. Designing difference in difference studies: best practices for public health policy research. *Annu Rev Public Health*. 2018;39:453–69.
63. Churruca K, Ludlow K, Wu W, Gibbons K, Nguyen HM, Ellis LA, et al. A scoping review of Q-methodology in healthcare research. *BMC Med Res Methodol*. 2021;21(1):125.
64. Baker R, Thompson C, Mannion R. Q methodology in health economics. *J Health Serv Res Policy*. 2006;11(1):38–45.
65. Bothwell LE, Greene JA, Podolsky SH, Jones DS. Assessing the gold standard—lessons from the history of RCTs. *N Engl J Med*. 2016;374(22):2175–81.
66. Kaptchuk TJ. The double-blind, randomized, placebo-controlled trial: gold standard or golden calf? *J Clin Epidemiol*. 2001;54(6):541–9.
67. Frakt AB. An observational study goes where randomized clinical trials have not. *JAMA*. 2015;313(11):1091–2.
68. Kennedy-Martin T, Curtis S, Faries D, Robinson S, Johnston J. A literature review on the representativeness of randomized controlled trial samples and implications for the external validity of trial results. *Trials*. 2015;16(1):1–14.
69. Roe BE, Just DR. Internal and external validity in economics research: tradeoffs between experiments, field experiments, natural experiments, and field data. *Am J Agric Econ*. 2009;91(5):1266–71.
70. Guduguntla V, McWilliams JM. Exploiting clinical decision-making thresholds to recover causal effects from observational data: randomization without trials. *JAMA Intern Med*. 2021;181(1):1–10.
71. Wilkinson MD, Dumontier M, Aalbersberg IJ, Appleton G, Axton M, Baak A, et al. The FAIR guiding principles for scientific data management and stewardship. *Sci Data*. 2016;3:160018.