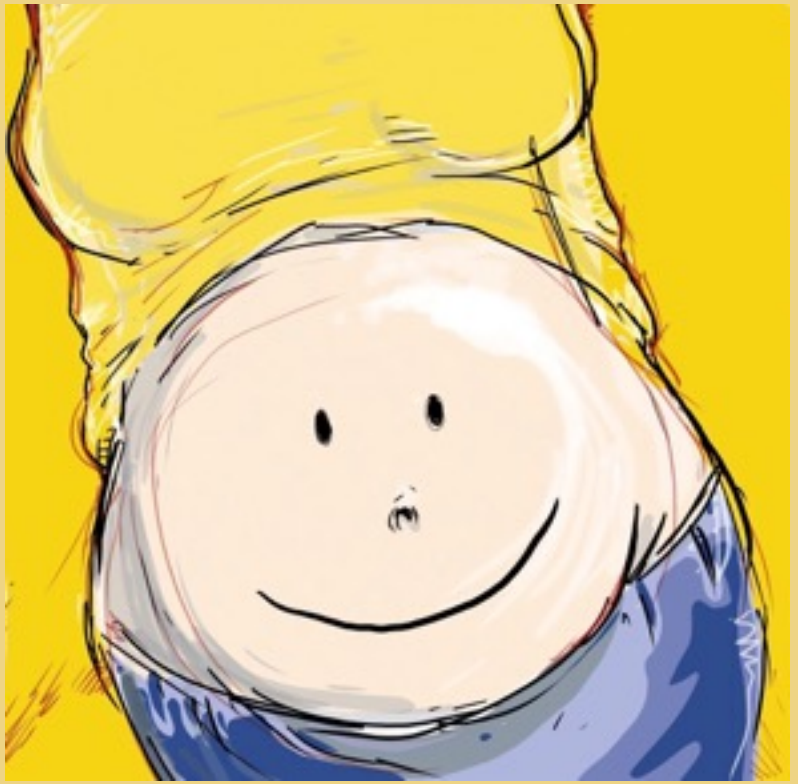
Nana Hyldig

# PICO ved kirurgiske sår



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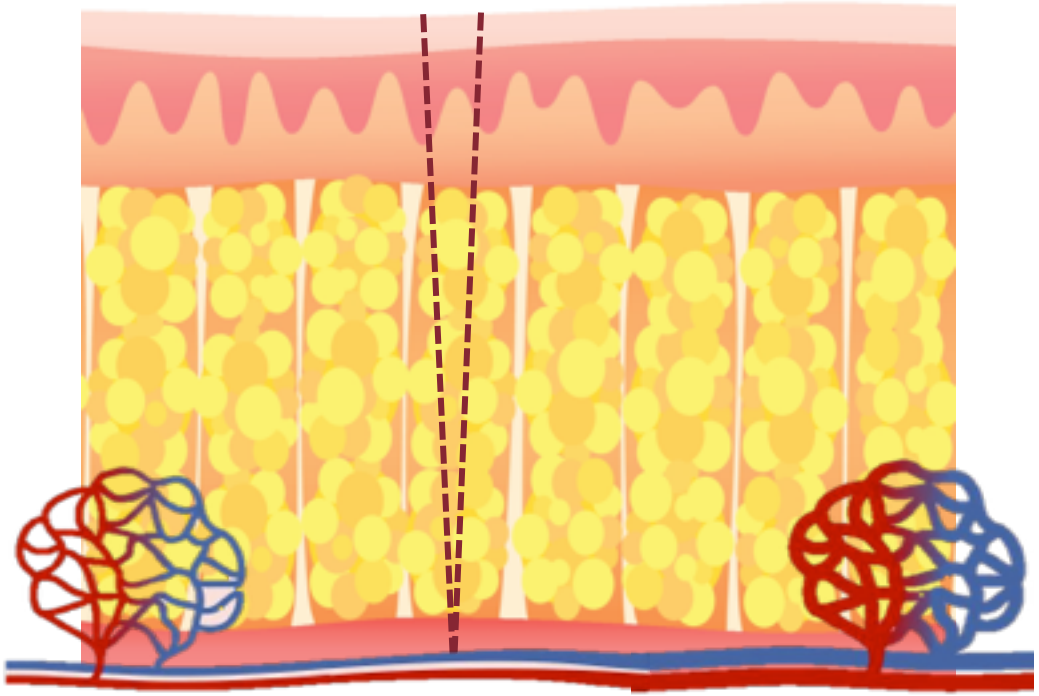
**Disclosure:** Har modtaget økonomisk støtte og holdt oplæg for firmaet Smith&Nephew.

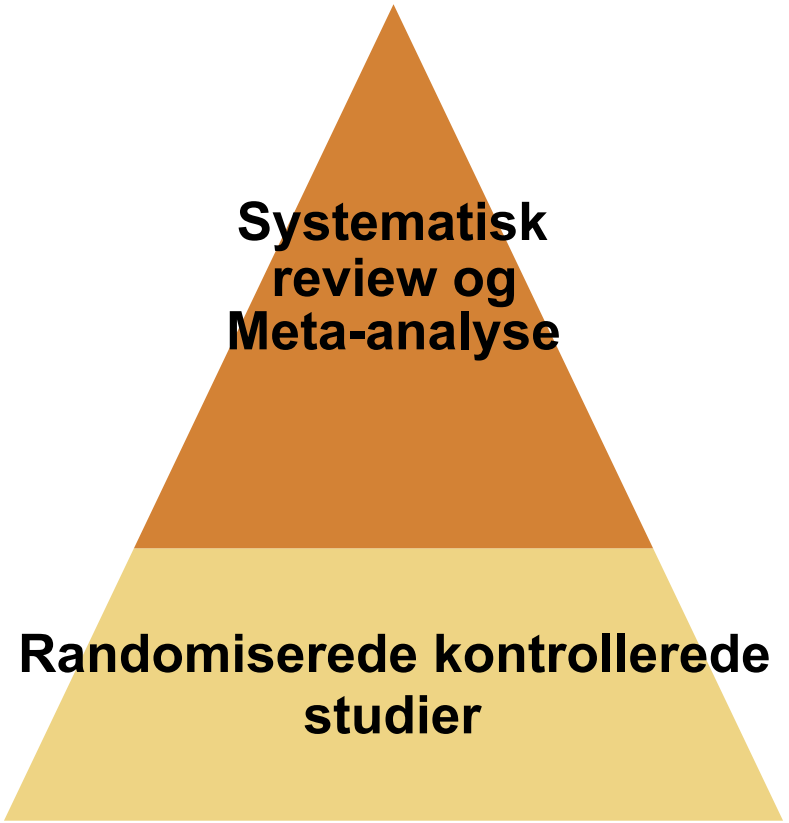
# Kan vi anvende vakuumbandager profylaktisk til forebyggelse af postoperative sårinfektioner*?*


OK

# Vakuumbehandling til lukkede incisioner



- Øger blodgennemstrømningen
- Øger lymfedrænagen
- Fjerner ødem
- Stabiliserer sårkanterne
- Fjerner fugt fra huden




- Randomiserede kontrollerede studier

**Systematisk review og meta-analyse**

- Incisional NPWT
- Standard bandager
- Lukkede incisioner
- Sårkomplikationer

SDU

# Systematisk review

Systematic review

## Meta-analysis of negative-pressure wound therapy for closed surgical incisions

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**Background:** Postoperative wound complications are common following surgical procedures. Negative-pressure wound therapy (NPWT) is well recognized for the management of open wounds and has been applied recently to closed surgical incisions. The evidence base to support this intervention is limited. The aim of this study was to assess whether NPWT reduces postoperative wound complications when applied to closed surgical incisions.

**Methods:** This was a systematic review and meta-analysis of randomized clinical trials of NPWT compared with standard postoperative dressings on closed surgical incisions.

**Results:** Ten studies met the inclusion criteria, reporting on 1311 incisions in 1089 patients. NPWT was associated with a significant reduction in wound infection (relative risk (RR) 0·54, 95 per cent c.i. 0·33 to 0·89) and seroma formation (RR 0·48, 0·27 to 0·84) compared with standard care. The reduction in wound dehiscence was not significant. The numbers needed to treat were three (seroma), 17 (dehiscence) and 25 (infection). Methodological heterogeneity across studies led to downgrading of the quality of evidence to moderate for infection and seroma, and low for dehiscence.

## Studiernes karakteristika

- 7 publicerede og 3 upublicerede studier
- Forskellige typer kirurgiske procedurer
- Forskellige typer NPWT pumper
- Behandlingen varierede fra 2 til 7 dage
- Follow-up varierede fra 10 dage til 1 år

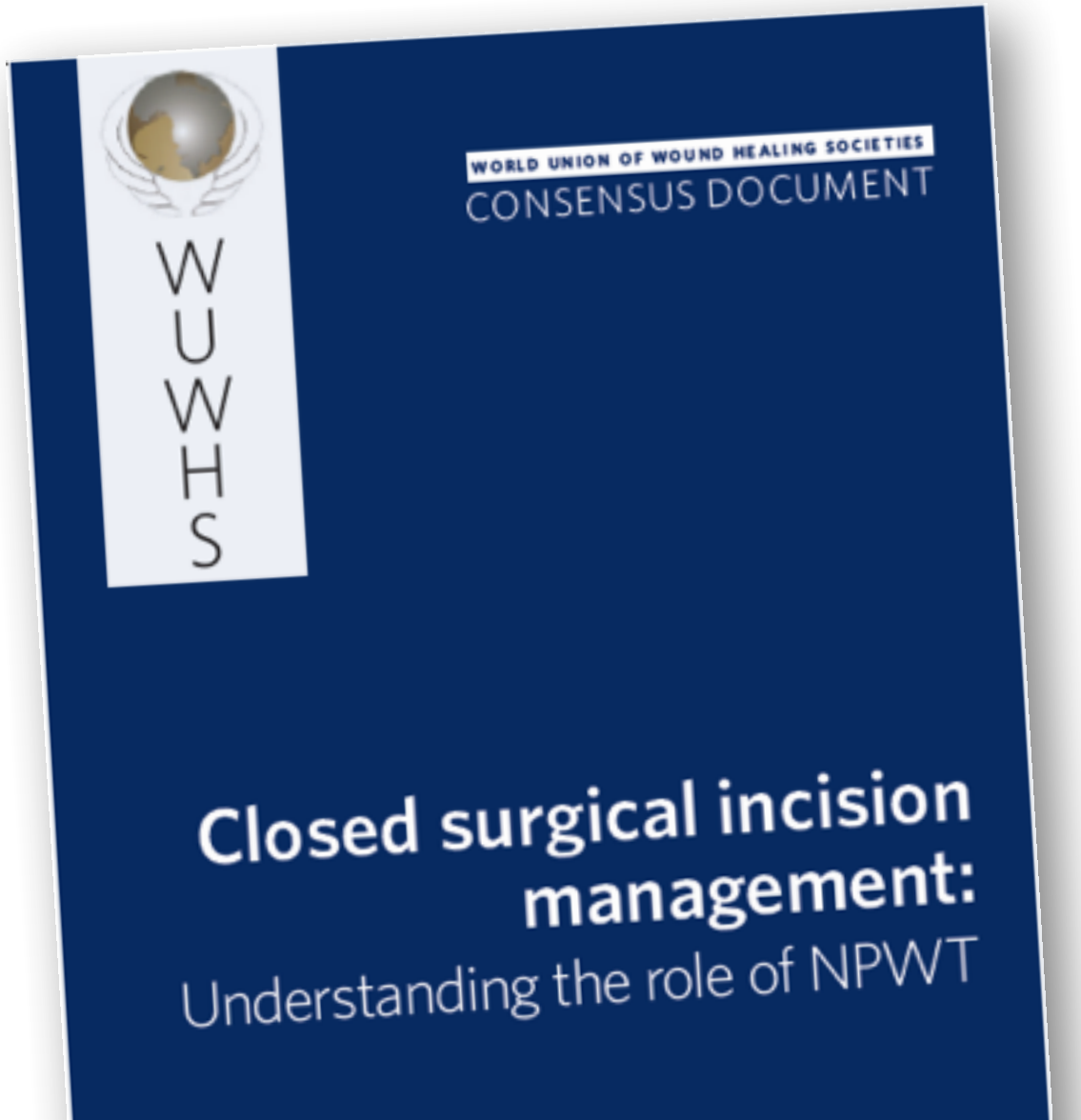
| Forfatter (årstal) | Antal incisioner | Type kirurgi |
|---|---|---|
| Pachowsky et al (2011) | 19 | Total hip arthroplasty |
| Howell et al (2011) | 60 | Total knee arthoplasty |
| Stannard et al (2012) | 263 | High-risk lower extremity fractures |
| Masden et al (2012) | 81 | Primary or delayed closure of lower extremity or abdominal wounds |
| Grauhan et al (2012) | 150 | Median sternotomy |
| Pauser et al (2014) | 21 | Hemiathro-plasty |
| Nordmeyer et al (2015) | 20 | Spinal fracture |
| Karlakki et al (2016) | 220 | Hip and knee replacement |
| Crist et al | 115 | Pelvic, acetabular and hip fractures |
| Galiano et al | 394 | Bilateral breast reduction |

## Opsummering af resultater

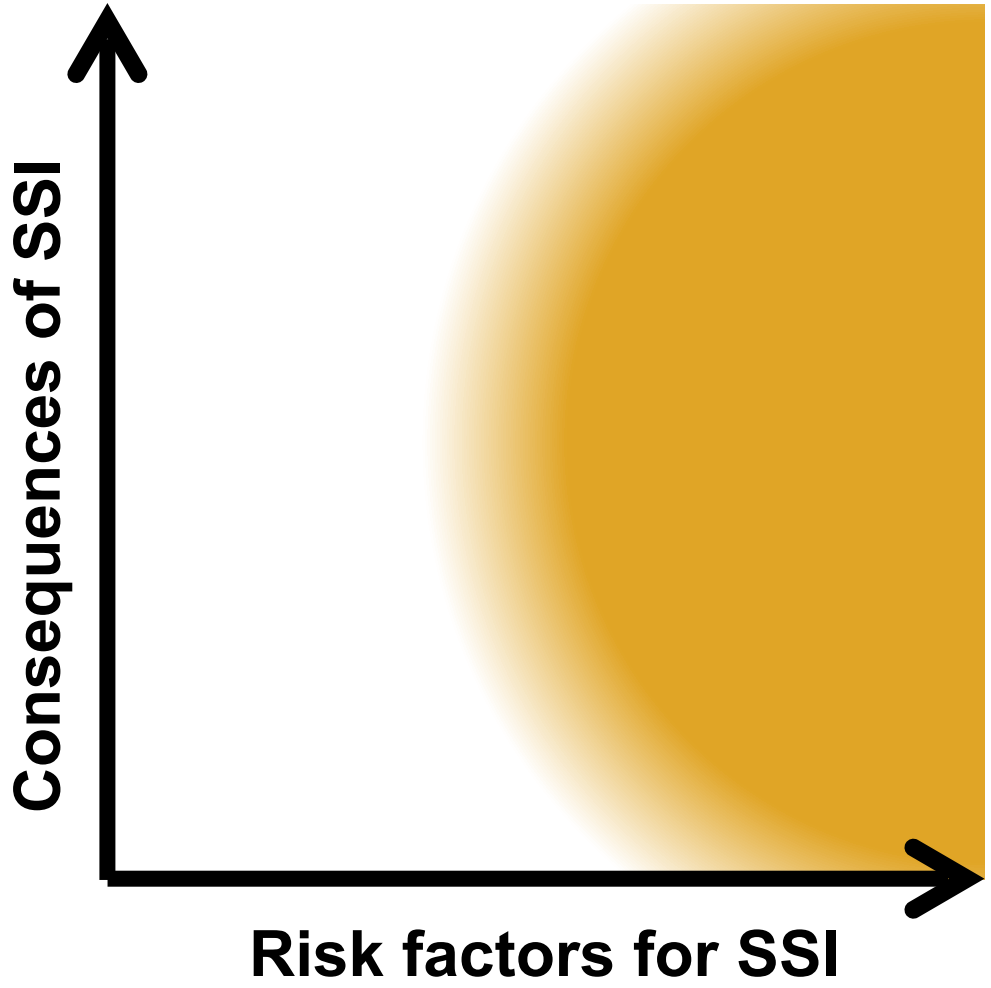
| Effektmål | Relativ risiko reduktion (95% CI) | Kvaliteten af evidensen | NNT (95% CI) |
|---|---|---|---|
| Sårinfektion | 46% (11%-77%) | MODERAT | 25 (17 – 93) |
| Sårruptur | 31% (-1%-53%)* | LAV | 17 (10 – -500) |
| Serom | 52% (16%-73%) | MODERAT | 3 (2 – 8) |

* Ikke statistisk signifikant

# NPWT til behandling af lukkede kirurgisk incisioner



# Risikofaktorer



# Generelle risikofaktorer

Table 2 | General risk factors for surgical site complications (adapted from[41,50,63,68,82,95])

| Category | Patient-related risk factors | Procedure-related risk factors |
|---|---|---|
| **Major risk factors**<br>Presence of 1 = high risk of surgical site complication | ■ BMI ≥40kg/m² or ≤18kg/m²<br>■ Uncontrolled insulin dependent diabetes mellitus<br>■ Renal dialysis | ■ Extended duration of surgery*<br>■ Emergency surgery<br>■ Hypothermia |
| **Moderate risk factors**<br>Presence of ≥2 = high risk of surgical site complication | ■ ASA Physical Status >II<br>■ Age <1 year or >75 years<br>■ BMI 30-39.9kg/m²<br>■ Diabetes mellitus<br>■ Chronic obstructive pulmonary disease ≥GOLD class 2<br>■ Renal insufficiency/chronic kidney disease<br>■ Immunosuppression<br>■ Steroids for a chronic condition<br>■ Chemotherapy<br>■ Pre-existing infection at a body site remote from operative site<br>■ Serum albumin <2.5g/dl<br>■ Smoking (current) | ■ Anaemia/blood transfusion<br>■ High wound tension after closure<br>■ Dual antiplatelet treatment<br>■ Suboptimal timing or omission of prophylactic antibiotics<br>■ Tissue trauma/large area of dissection/ large area of undermining |
| **Minor risk factors**<br>**Presence of any = increased risk of surgical site complications** | ■ African or African-American race<br>■ BMI 25-29.9kg/m²<br>■ Extended pre-operative hospitalisation or residency in a nursing home<br>■ Peripheral vascular disease<br>■ Congestive cardiac failure with left ventricular ejection fraction <30% | ■ Failure to obliterate dead space<br>■ Location of incision<br>■ Previous surgery<br>■ Surgical drains |

From WUWHS SSI consensus document

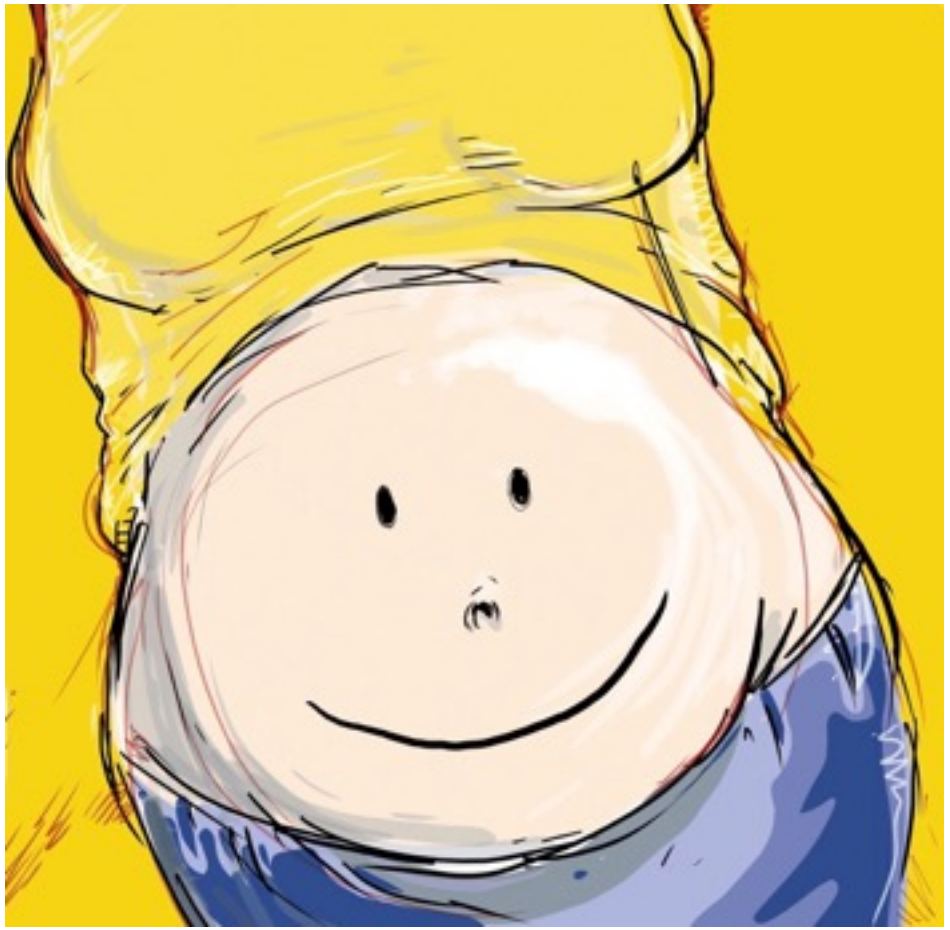
# Risikofaktorer ved forskellige typer operationer

Table 3 | Examples of the main additional risk factors for surgical site complications by selected surgery type (adapted from[88,91,96,111])

| Type of surgery | Additional risk factors |
|---|---|
| Abdominal | ■ Perforated viscus<br>■ Ostomy formation/closure<br>■ Previous radiotherapy to surgical site<br>■ Multiple incisions |
| Breast/plastic | ■ Corony artery disease<br>■ Bleeding risk<br>■ Breast Reconstruction Risk Assessment (BRA) score |
| Cardiothoracic | ■ Bilateral internal mammary artery harvesting<br>■ Chest wall radiotherapy<br>■ Left ventricular assist device (LVAD)<br>■ Transplant<br>■ Cardiopulmonary bypass time extended<br>■ Delayed closure |
| Paediatric | ■ Very low birthweight** (<1kg) }<br>■ Bone marrow aplasia } major risk factors |

From WUWHS SSI consensus document

# PROJEKT
# GLADE MAVER



## Formål

*"At undersøge effekten af profylaktisk vakuumbehandling til svært overvægtige kvinder der har født ved kejsersnit"*

# Maternal overvægt

- Nedsat blodgennemstrømning i fedtvæv
- Lokal hypoxi i vævet
- Øget risikoen for postoperativ sårinfektion

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Randomised control trials

# Prophylactic incisional negative pressure wound therapy reduces the risk of surgical site infection after caesarean section in obese women: a pragmatic randomised clinical trial

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**Objective** To evaluate the reduction of surgical site infections by prophylactic incisional negative pressure wound therapy compared with standard postoperative dressings in obese women giving birth by caesarean section.

**Design** Multicentre randomised controlled trial.

**Setting** Five hospitals in Denmark.

**Population** Obese women (prepregnancy body [illegible] (BMI) ≥30 kg/m²

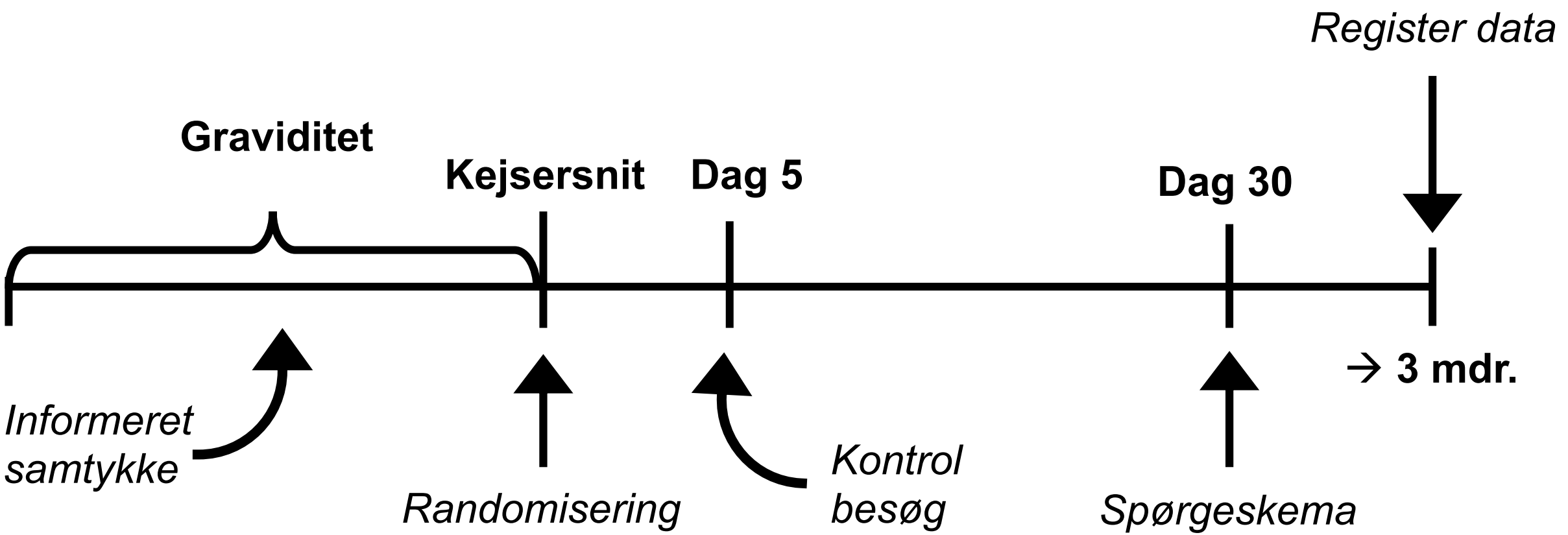
**Results** Incisional negative pressure wound therapy was applied to 432 women and 444 women had a standard dressing. Demographics were similar between groups. Surgical site infection occurred in 20 (4.6%) women treated with incisional negative pressure wound therapy and in 41 (9.2%) women treated with a standard dressing (relative risk 0.50, 95% CI 0.30–0.84; number needed to treat 22; $P = 0.007$). The effect remained statistically significant [illegible]

# Design

- Multicenter studie
- Pragmatisk design
- Ikke-blindet
- PICO bandage vs. standard bandage
- 876 kvinder

## Inklusionskriterier

- Præ-gestationelt BMI ≥ 30 kg/m$^2$
- Alder ≥ 18 år
- Læse og forstå dansk
- Føde ved planlagt eller akut kejsersnit


Register data
Graviditet
Kejsersnit
Dag 5
Dag 30
→ 3 mdr.
Informeret samtykke
Randomisering
Kontrol besøg
Spørgeskema

## Primært effektmål

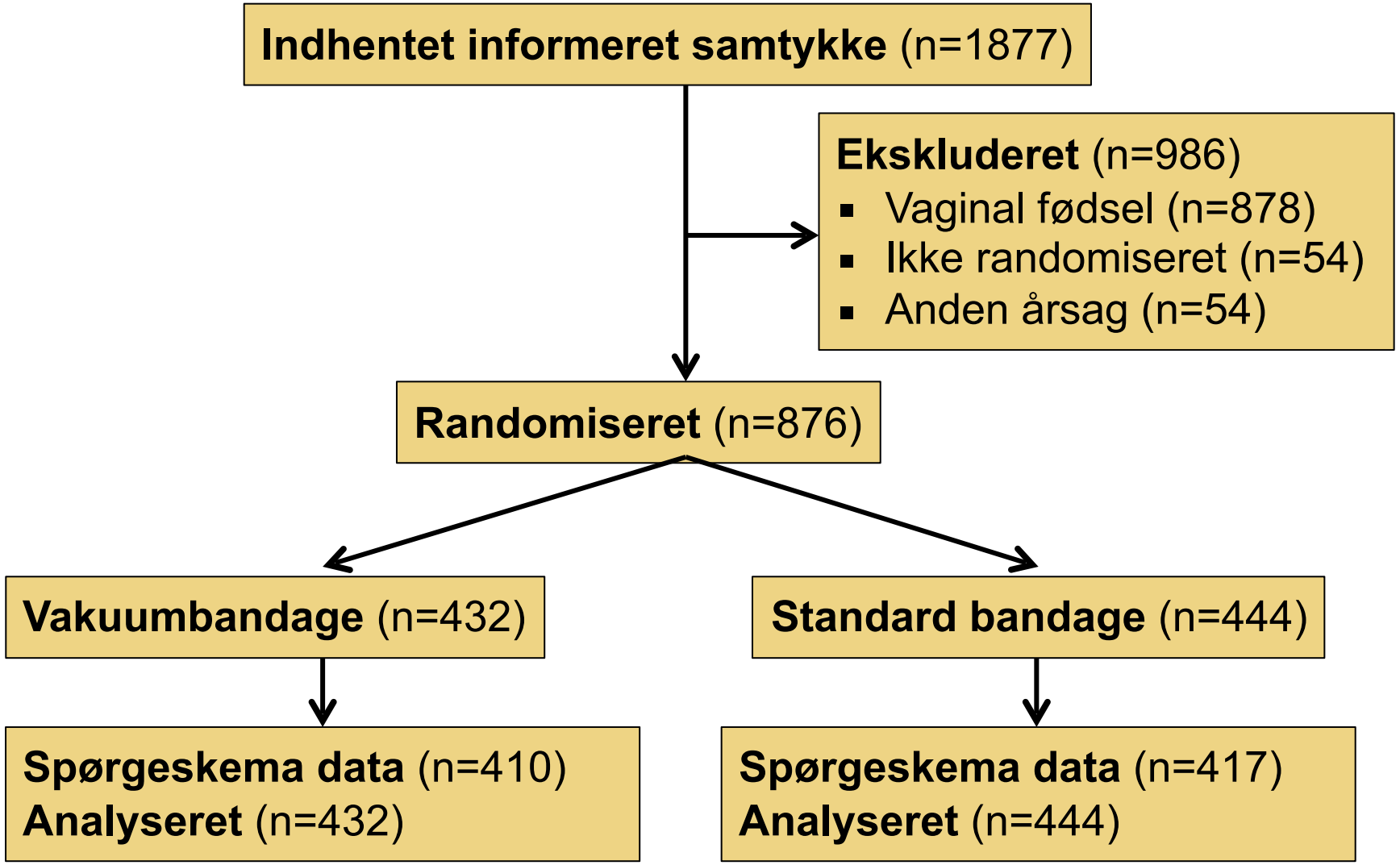
Behandlingskrævende sårinfektion

## Sekundære effektmål

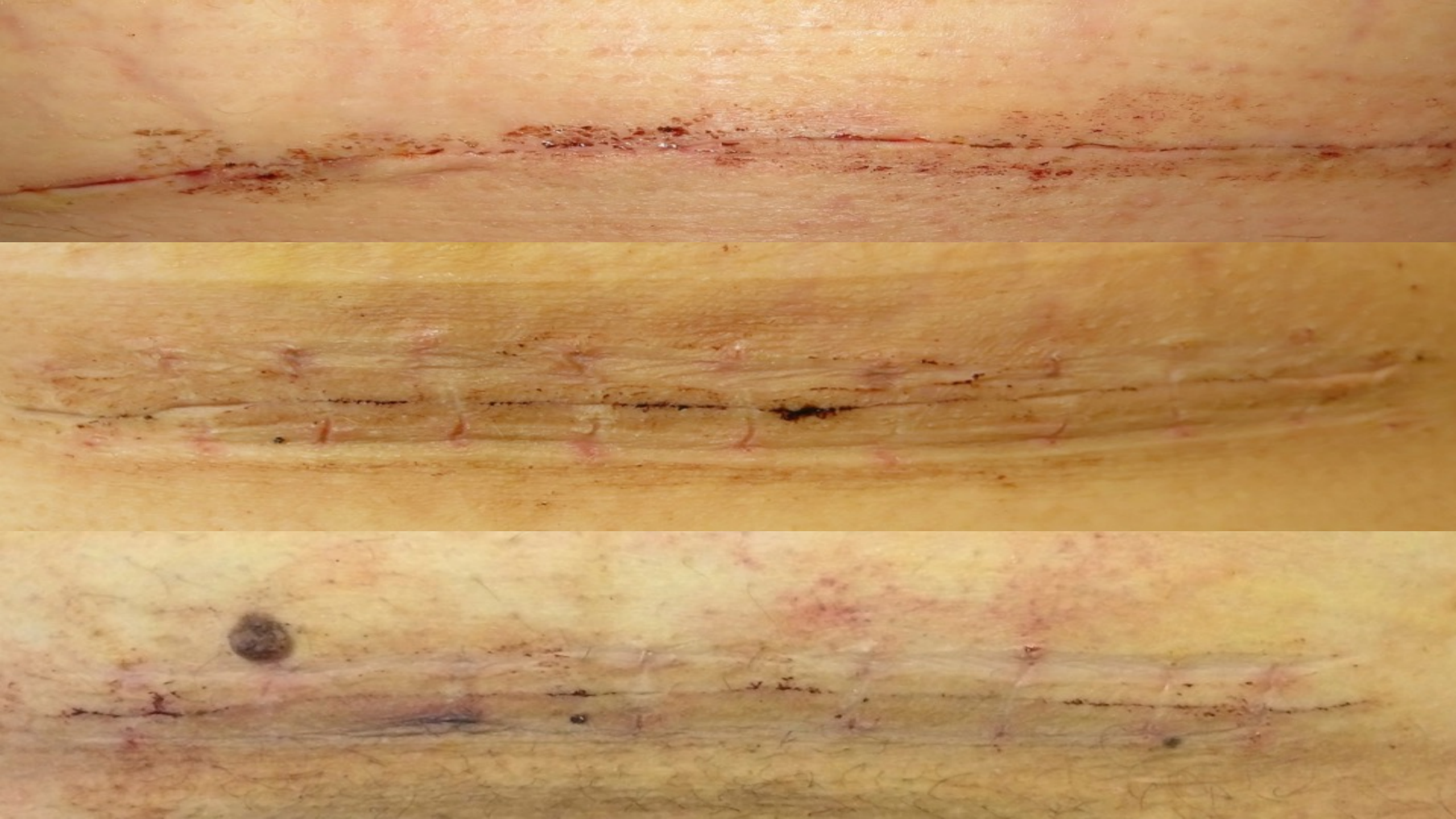
Andre postoperative sårkomplikationer

Helbredsrelateret livskvalitet (EQ-5D)

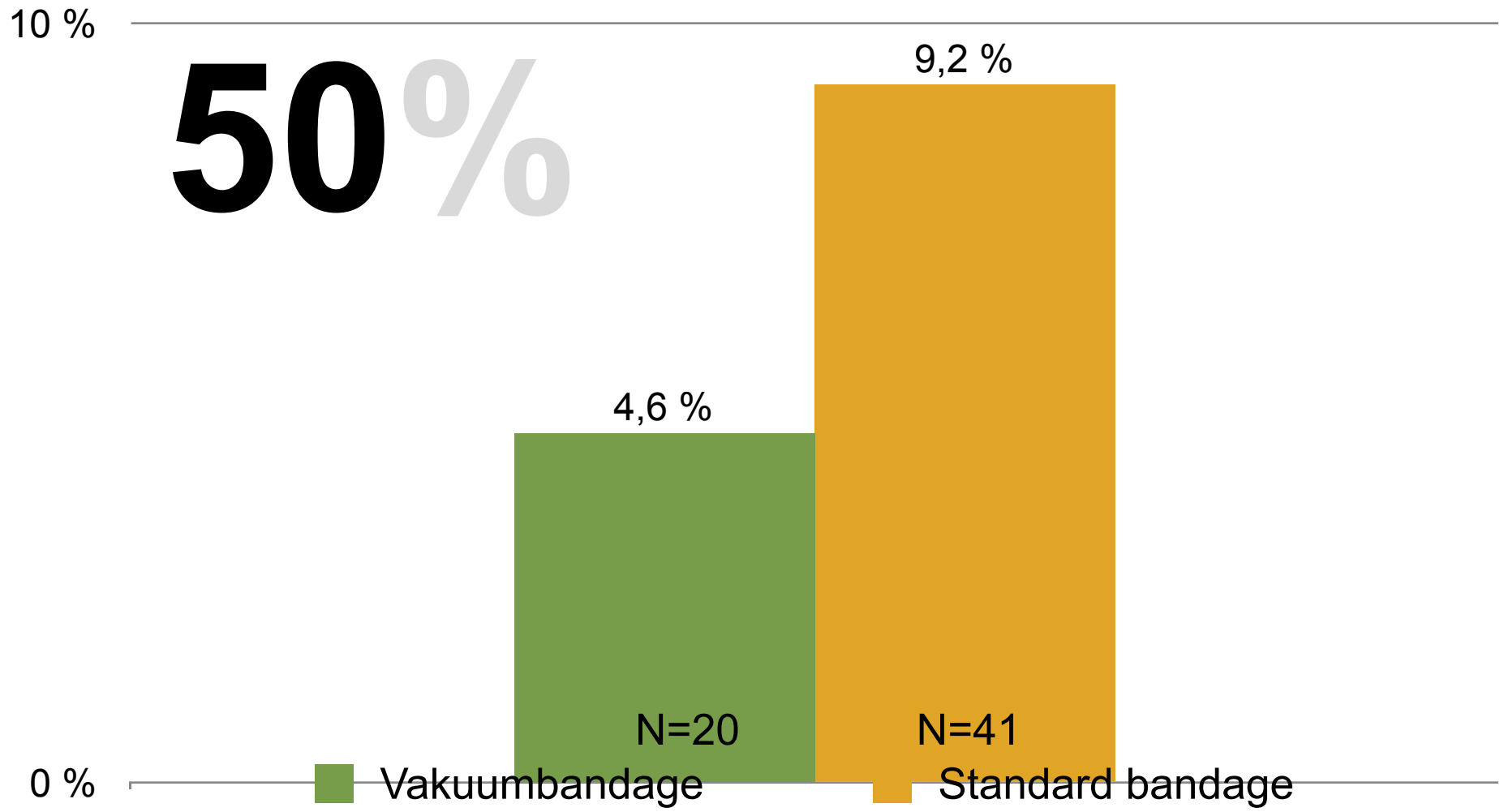
# Flow chart


**Indhentet informeret samtykke** (n=1877)
**Ekskluderet** (n=986)
Vaginal fødsel (n=878)
Ikke randomiseret (n=54)
Anden årsag (n=54)
**Randomiseret** (n=876)
**Vakuumbandage** (n=432)
**Standard bandage** (n=444)
**Spørgeskema data** (n=410)
**Analyseret** (n=432)
**Spørgeskema data** (n=417)
**Analyseret** (n=444)

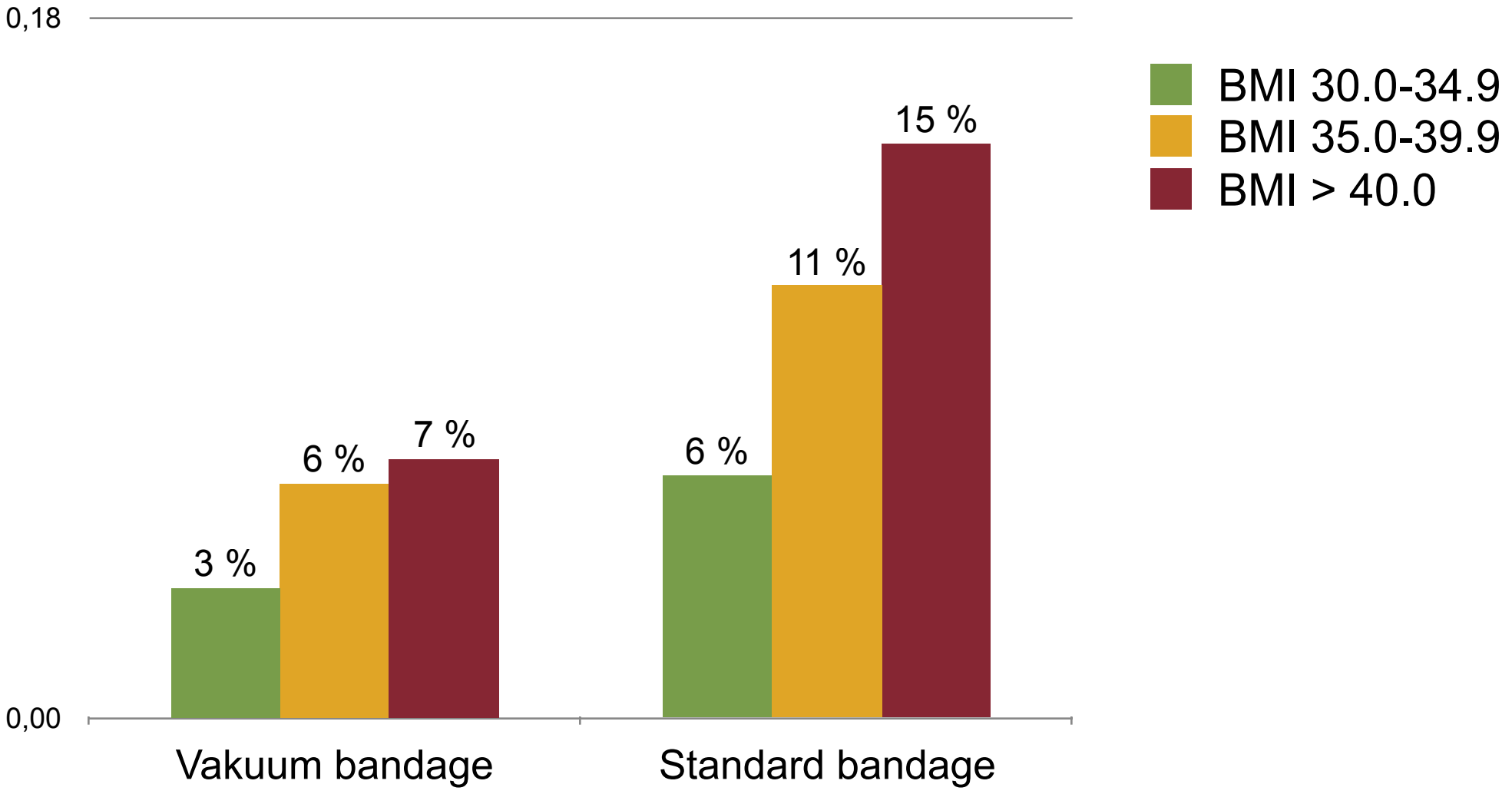
| Baseline variabler | Intervention (n=432) | Kontrol (n=444) |
|---|---|---|
| **Mors alder** (mean±SD) | 32 (5) | 32 (5) |
| **Præ-gestationel BMI** (median+IQR) | 34.7 (31.5–38.2) | 34.2 (31.6–38.1) |
| **Diabetes** | 80 (19%) | 90 (20%) |
| **Type kejsersnit** | | |
| Planlagt | 229 (53%) | 235 (53%) |
| Akut | 203 (47%) | 209 (47%) |
| **Sutureringsmaterial** | | |
| Agraffer | 260 (60%) | 264 (59%) |
| Intracutante suturer | 172 (40%) | 177 (40%) |



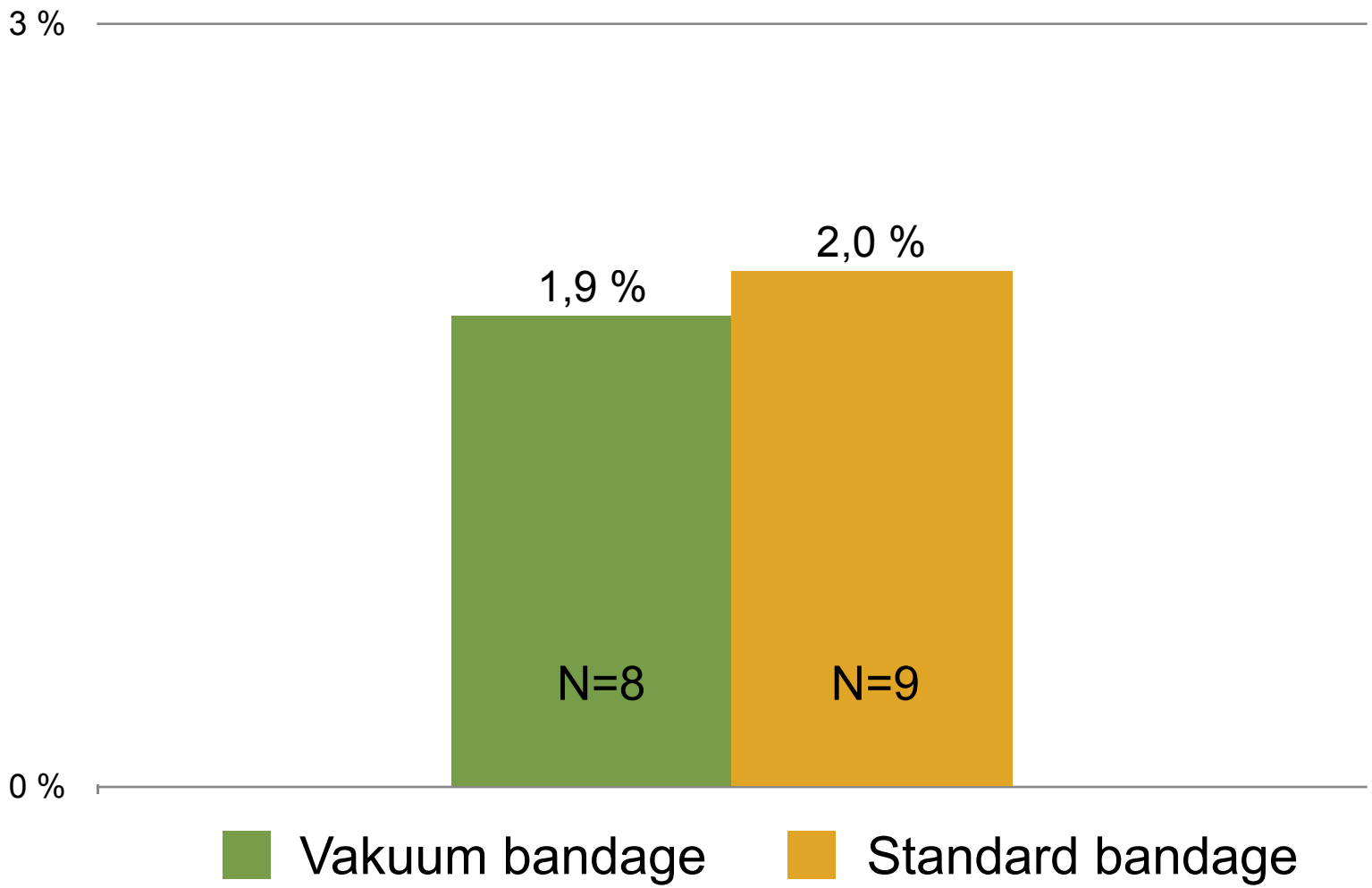
# Behandlingskrævende sårinfektion



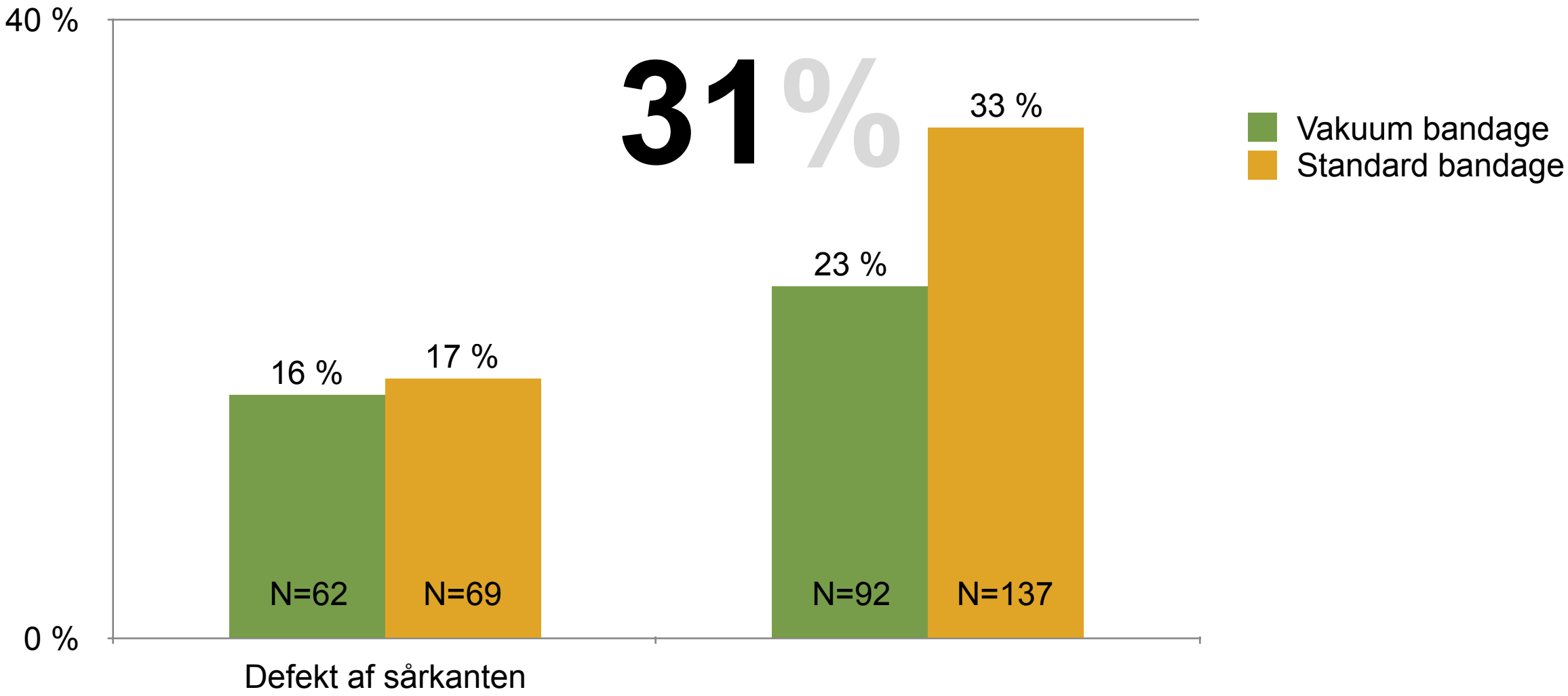
# Sårinfektion stratificeret på BMI kategorier



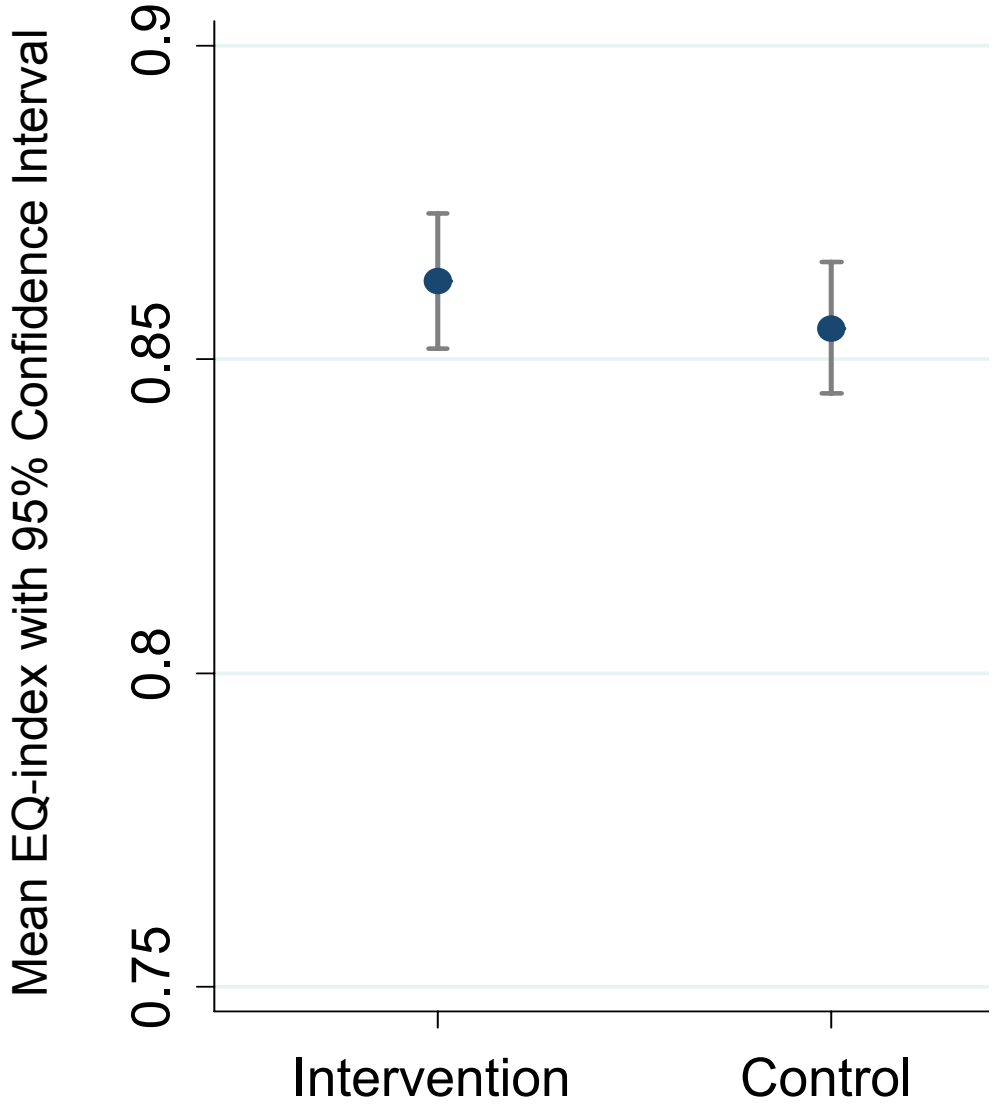
# Operationskrævende sårinfektion



# Andre sårkomplikationer



# Helbredsrelateret livskvalitet, 30 dage efter sectio



## Opsummering

- Effektiv behandling til at forebygge postoperativ sårinfektion hos svært overvægtige kvinder, der føder ved kejsersnit.
- En sårinfektion har negative konsekvenser for patienten såvel som for sundhedsvæsnet.
- En sideløbende økonomisk evaluering har vist at behandlingen er omkostningseffektiv sammenlignet med standard bandager.