

Impact of Wound Hygiene incorporating an antibiofilm gelling fibre dressing on hard-to-heal diabetic foot ulcers

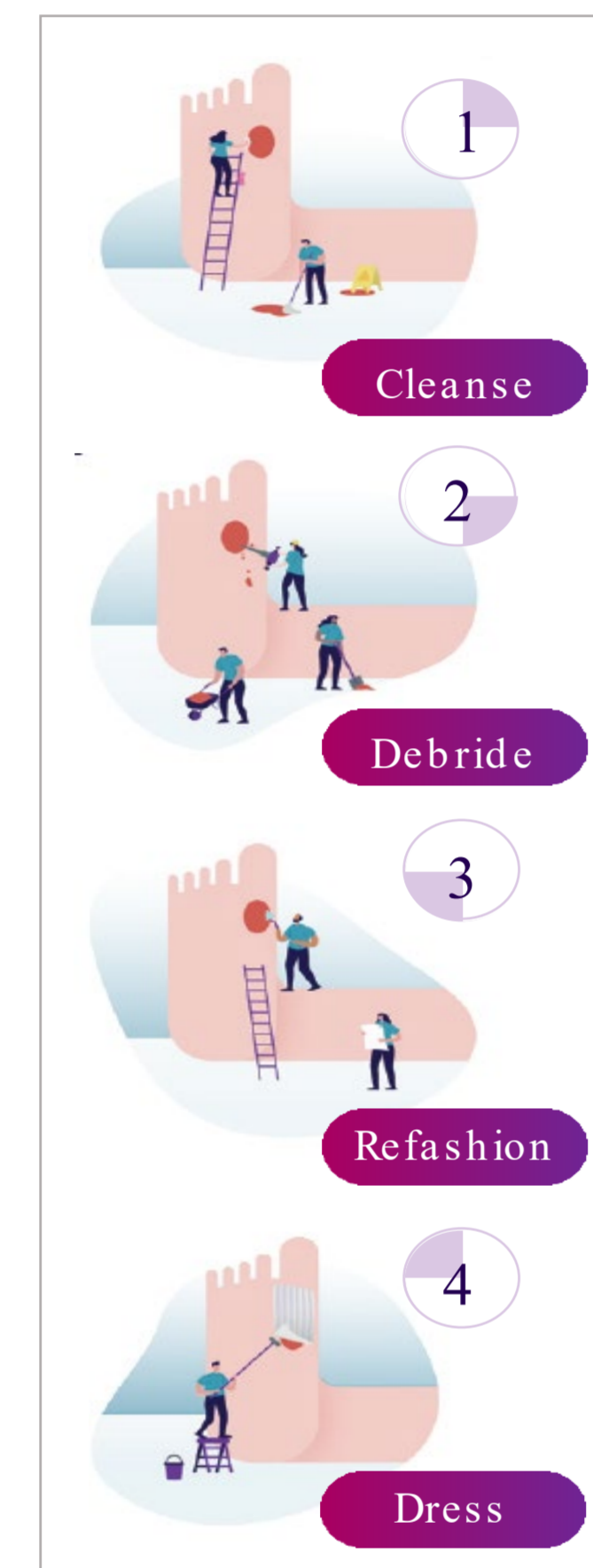
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Background

- Hard-to-heal wounds are a major challenge to healthcare systems globally¹:
 - Estimated prevalence of 2.21 per 1,000 population²
 - Associated with reduced patient health-related quality of life and substantial economic burden^{3,4}
- Biofilm is strongly implicated in hard-to-heal wounds⁵:
 - At least 78% of hard-to-heal wounds are estimated to harbor biofilm⁶
 - Biofilm protects microorganisms from antibiotics, antiseptics, and the host immune response⁵
- Wound Hygiene is 4-step standardized approach to biofilm management and wound care (Figure 1)⁷⁻⁹:
 - Developed by an international panel of wound care specialists
 - Allows biofilm-based wound care to administered early, safely, and consistently in any clinical setting

Figure 1. Wound Hygiene protocol



Objective

To evaluate the impact of Wound Hygiene (incorporating an advanced antibiofilm dressing*) on hard-to-heal diabetic foot ulcers

Methods

- A subgroup analysis of patients with diabetic foot ulcers (DFUs) in a prospective, real-world analysis of hard-to-heal wounds managed with Wound Hygiene
- Patients were enrolled from different wound care settings across Spain, Italy, the United Kingdom, Poland, the Netherlands, and Portugal
- Between 01 April 2021 and 31 December 2022, patients were managed with Wound Hygiene (incorporating an advanced antibiofilm CMC dressing containing ionic silver, EDTA and BEC*) for approximately 4 weeks or as deemed clinically appropriate
- The primary endpoint was change in DFU volume from baseline to final assessment
- Secondary endpoints were qualitative changes in exudate levels, suspected biofilm¹⁰, signs of local infection¹⁰, and overall wound status

Results

- A total of 66 DFUs were included in this analysis (median Wound Hygiene treatment duration 35 days)
- Of 58 DFUs with baseline and final wound volume assessments, 20 (34%) had a 100% reduction in wound volume, and 86% had at least one-third volume reduction (Figure 2)
- Mean DFU volume reduced from 37.9 cm³ at baseline to 3.3 cm³ at final assessment (91% reduction) ($p < 0.001$ in Wilcoxon signed-rank test)
- Exudate levels shifted from predominantly moderate (44%) or high (27%) at baseline, to predominantly low (42%) or none (21%) at the final assessment (Figure 3); change was significant ($p < 0.0003$ in McNemar's test)
- Biofilm suspicion¹⁰ was 83% at baseline and 24% at final assessment, a 71% reduction (Figure 4) ($p < 0.001$ in McNemar's test)
- Signs of local infection¹⁰ were present in 47% of DFUs at baseline, reducing to 3.0% at final assessment (Figure 5) ($p < 0.001$ in McNemar's test)
- At the final assessment, most DFUs had improved (70%) or healed (18%), and only a small proportion were deteriorating (18% → 4.5%) or static (47% → 6.1%) (Figure 6)

Figure 2. Percentage change in DFU volume

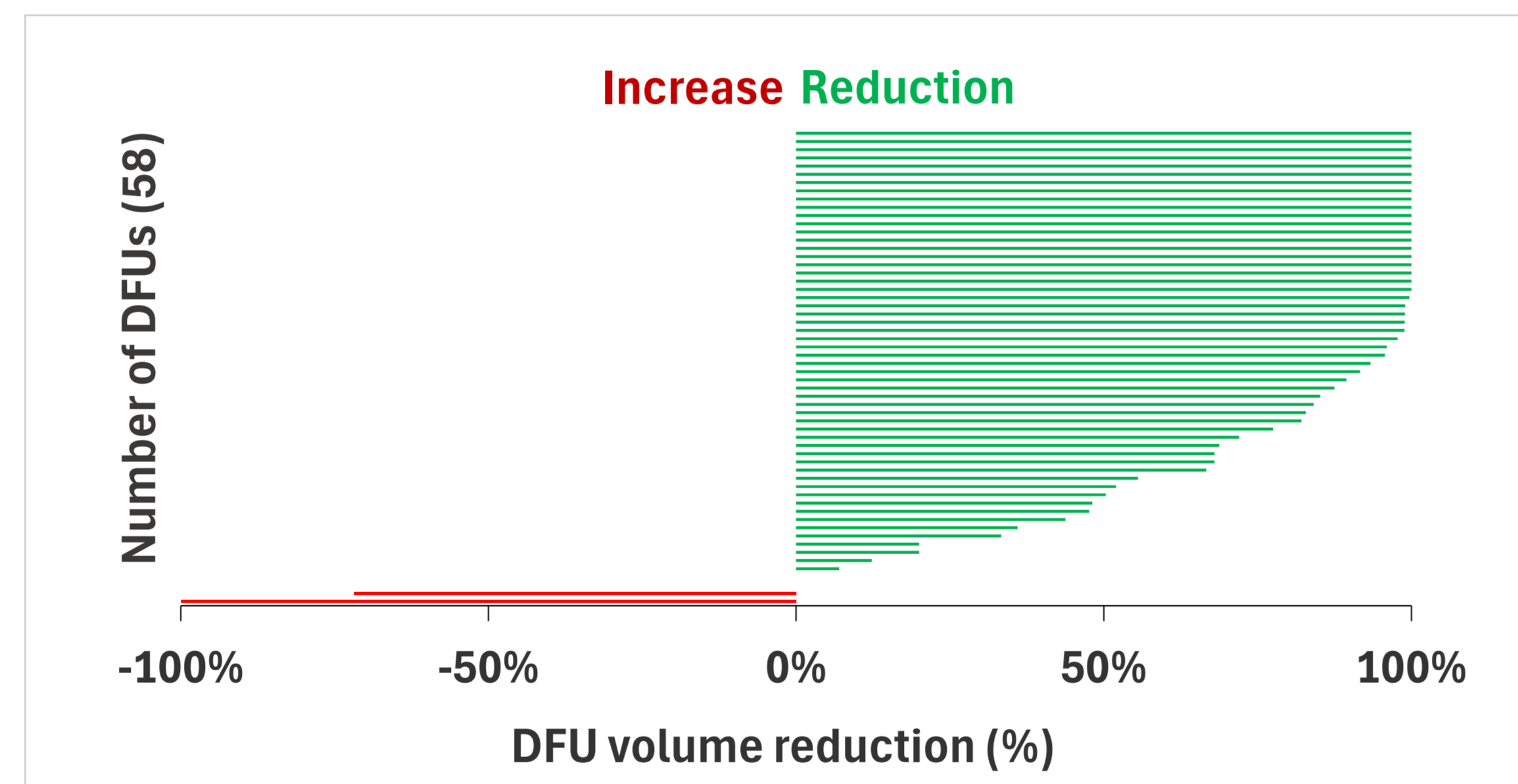


Figure 3. Wound exudate

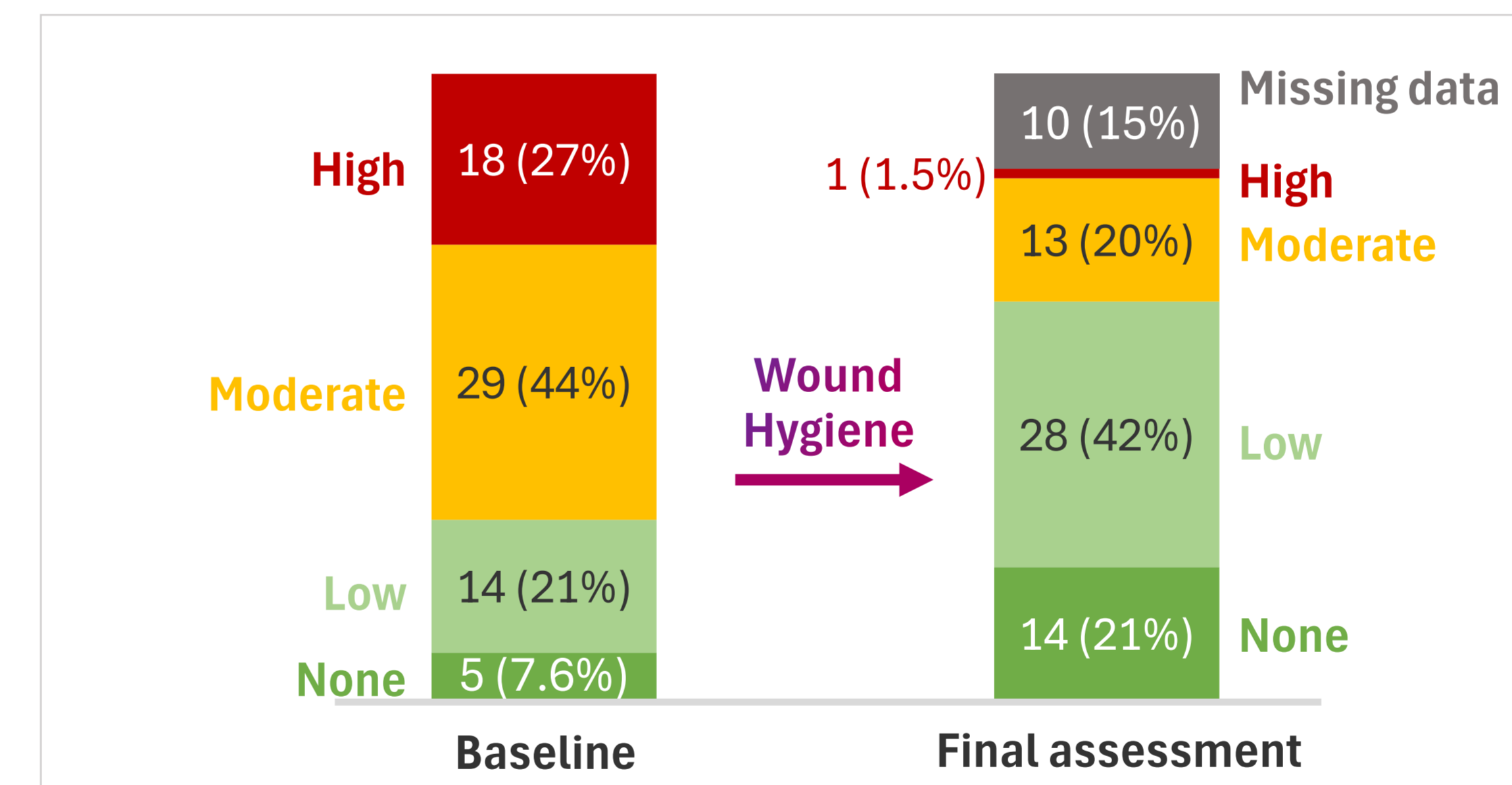


Figure 4. Suspected biofilm¹⁰

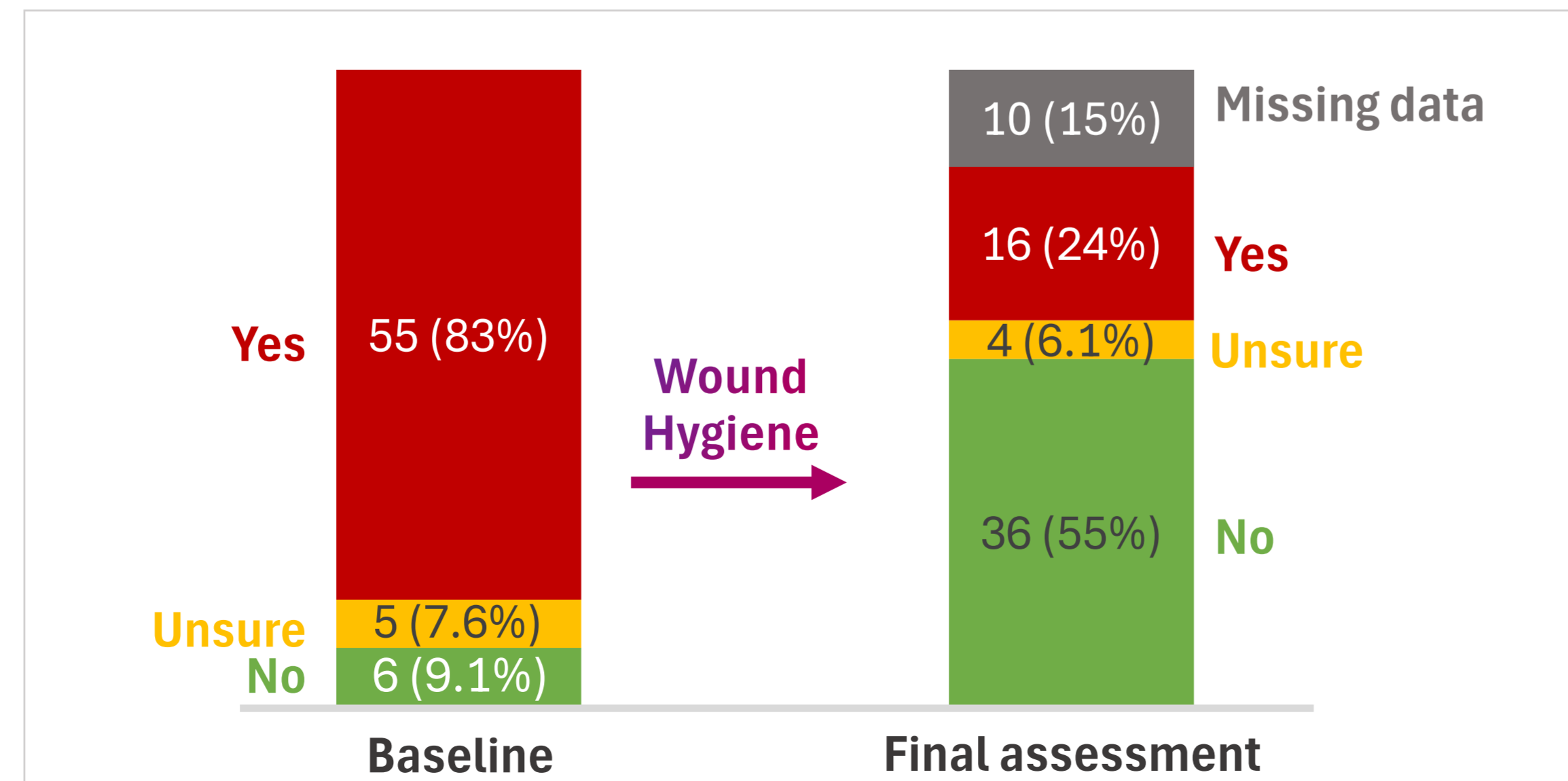


Figure 5. Local infection¹⁰

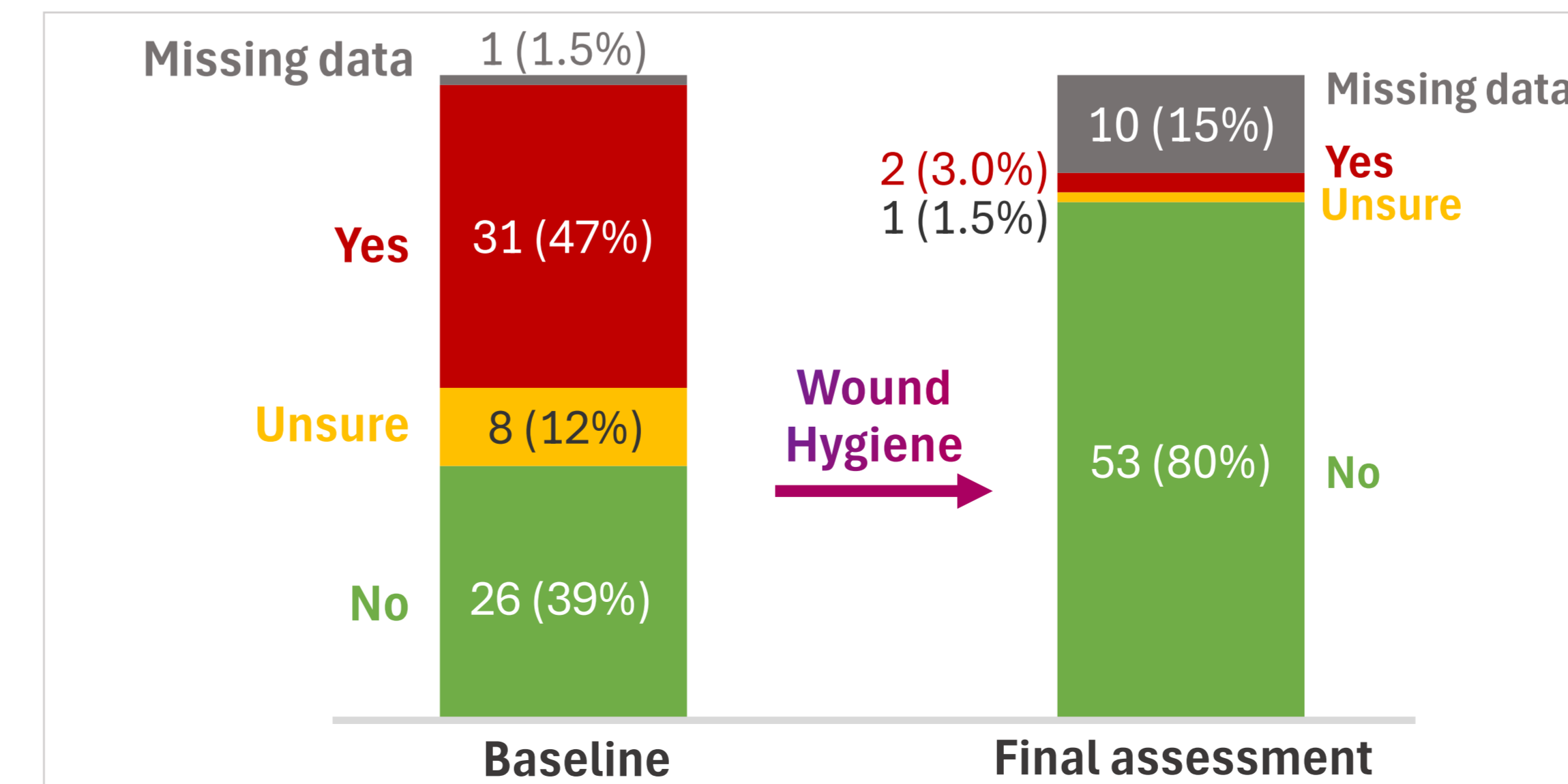
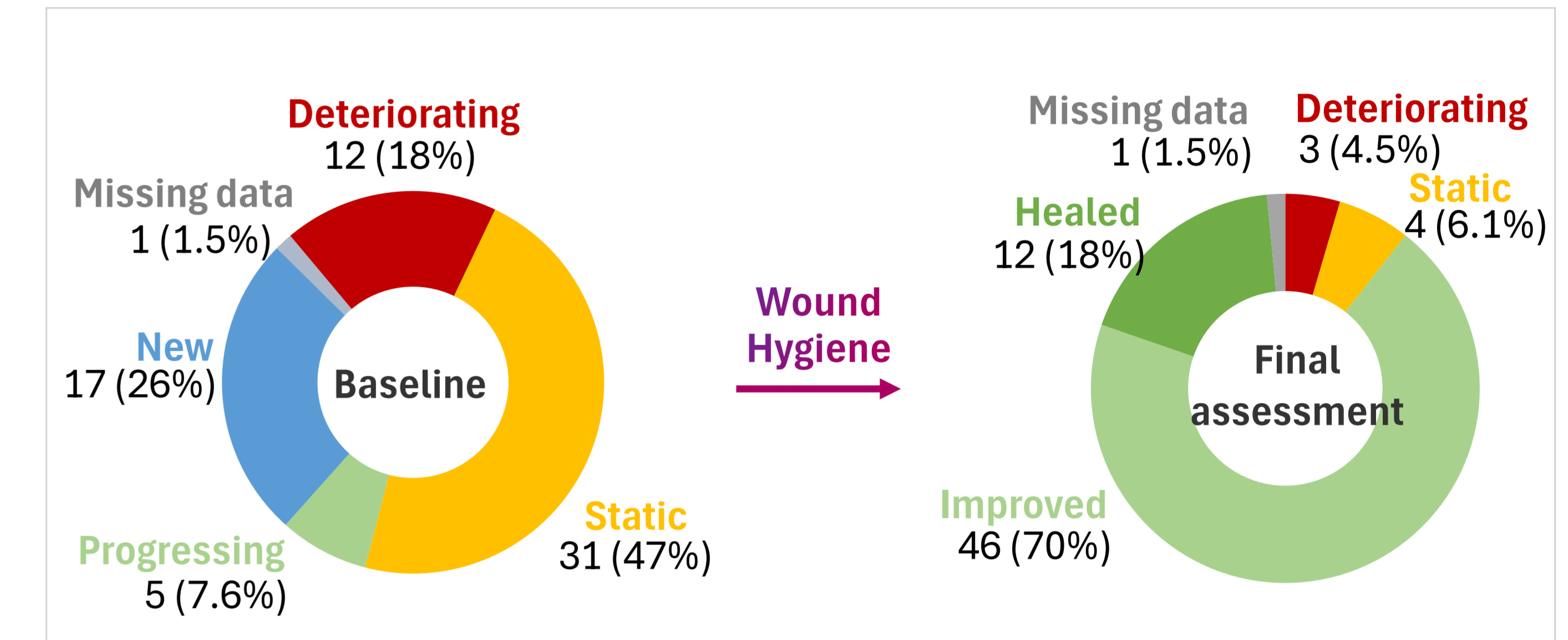


Figure 6. Wound status



Discussion

- Management with Wound Hygiene resulted in healing or improvement in nearly all hard-to-heal DFUs, and a statistically significant decrease in wound volume, exudate level, suspected biofilm¹⁰, and local infection¹⁰
- Incorporation of an advanced antibiofilm dressing* into Wound Hygiene protocols may further facilitate wound healing by helping to reduce overall bioburden
- Wound Hygiene addresses a key local barrier to healing (i.e., biofilm), and can help minimize variation in biofilm-based wound care across different clinical settings

Conclusion

Our findings suggest that the Wound Hygiene protocol incorporating an advanced antibiofilm dressing at step 4 is an effective treatment strategy for hard-to-heal diabetic foot ulcers

References & Footnotes

1. Rice JB et al. *Diabetes Care* 2014;37(3):651-658. 2. Martinengo L et al. *Ann Epidemiol* 2019;29:8-15. 3. Olsson M et al. *Wound Repair Regen* 2019;27(1):114-125. 4. Chan B et al. *J Wound Care* 2017;26(Suppl 4):S4-S14. 5. James GA et al. *Wound Repair Regen* 2008;16(1):37-44. 6. Malone M et al. *J Wound Care* 2017;26(1):20-25. 7. Murphy C et al. *J Wound Care* 2020;29(Sup3b):S1-S26. 8. Murphy C et al. *J Wound Care* 2019;28(12):818-822. 9. Murphy C et al. *J Wound Care* 2021;30(7):582-590. 10. Haesler E et al. *J Wound Care* 2019;28(Sup3b):S4-S12.

*Aquacel® Ag+ Extra™ (Aquacel Ag Advantage in the United States).

Abbreviations: BEC: benzethonium chloride; CMC: carboxymethylcellulose; EDTA: ethylenediaminetetraacetic acid; HCP: healthcare professional