

EFFECT OF HOUSEHOLD SIZE ON NASOPHARYNGEAL PNEUMOCOCCAL CARRIAGE PREVALENCE IN NEPALI CHILDREN

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INTRODUCTION

- Crowding may be important determining factor for pneumococcal disease risk through aerosol transmission of pneumococci.¹
- Hence household crowding may be an important factor determining nasopharyngeal (NP) carriage prevalence of pneumococcus.
- We investigated this relationship in Nepali children using samples collected before and after PCV10 vaccine introduction.

METHODS

- 4755 healthy children under 2 years of age were enrolled from an urban setting in Kathmandu and a rural setting in Okhaldhunga.
- NP swabs were collected, cultured and serotyped using standard methods.
- Household size was recorded for each participant.
- Household size was categorized into 4 groups: 2-3, 4-5, 6-7 and more than 7 member households.
- Chi-square test was used to compare the proportions in between the groups.

RESULTS

- In Kathmandu, 1749 and 1492 healthy children were enrolled before (2014-2015) and after (2016-2017) PCV10 introduction, respectively. In Okhaldhunga, 600 and 914 children were enrolled before (February 2015) and after (February 2017) PCV10 introduction respectively.
- **Before PCV10 introduction**, pneumococcal NP carriage prevalence in **urban households** (including the swabbed child) with 2-3, 4-5, 5-6 and >7 members were 64% (330/516), 65% (498/769), 68% (196/289) and 62% (108/175) respectively (p value=0.564).
- Similarly, carriage prevalence in children from **rural households** with 2-3, 4-5, 6-7 and >7 members were 81% (92/113), 83% (247/296), 86% (113/132) and 81% (48/59) respectively (p value=0.811).
- **After PCV10 introduction**, pneumococcal carriage prevalence in children from **urban households** with 2-3, 4-5, 6-7 and >7 members were 66% (270/412), 62% (401/646), 60% (158/265) and 69% (117/169) respectively (p value=0.145).
- **Rural carriage** prevalence in children from households with 2-3, 4-5, 6-7 and >7, after PCV10 introduction, were 79% (148/188), 85% (348/412), 86% (176/205) and 88% (96/109) respectively (p value=0.120).

FIGURE 1

Pneumococcal Carriage Prevalence by Household Size

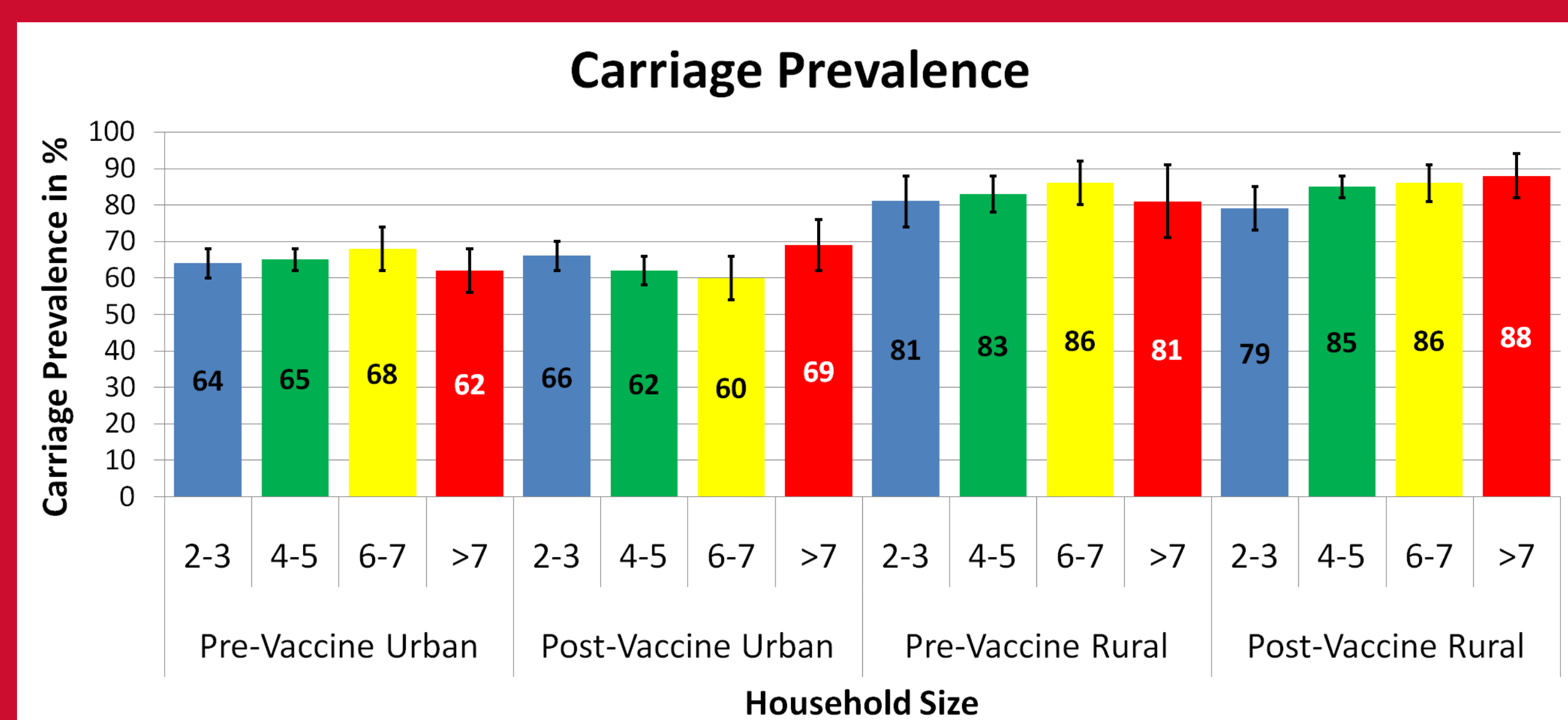
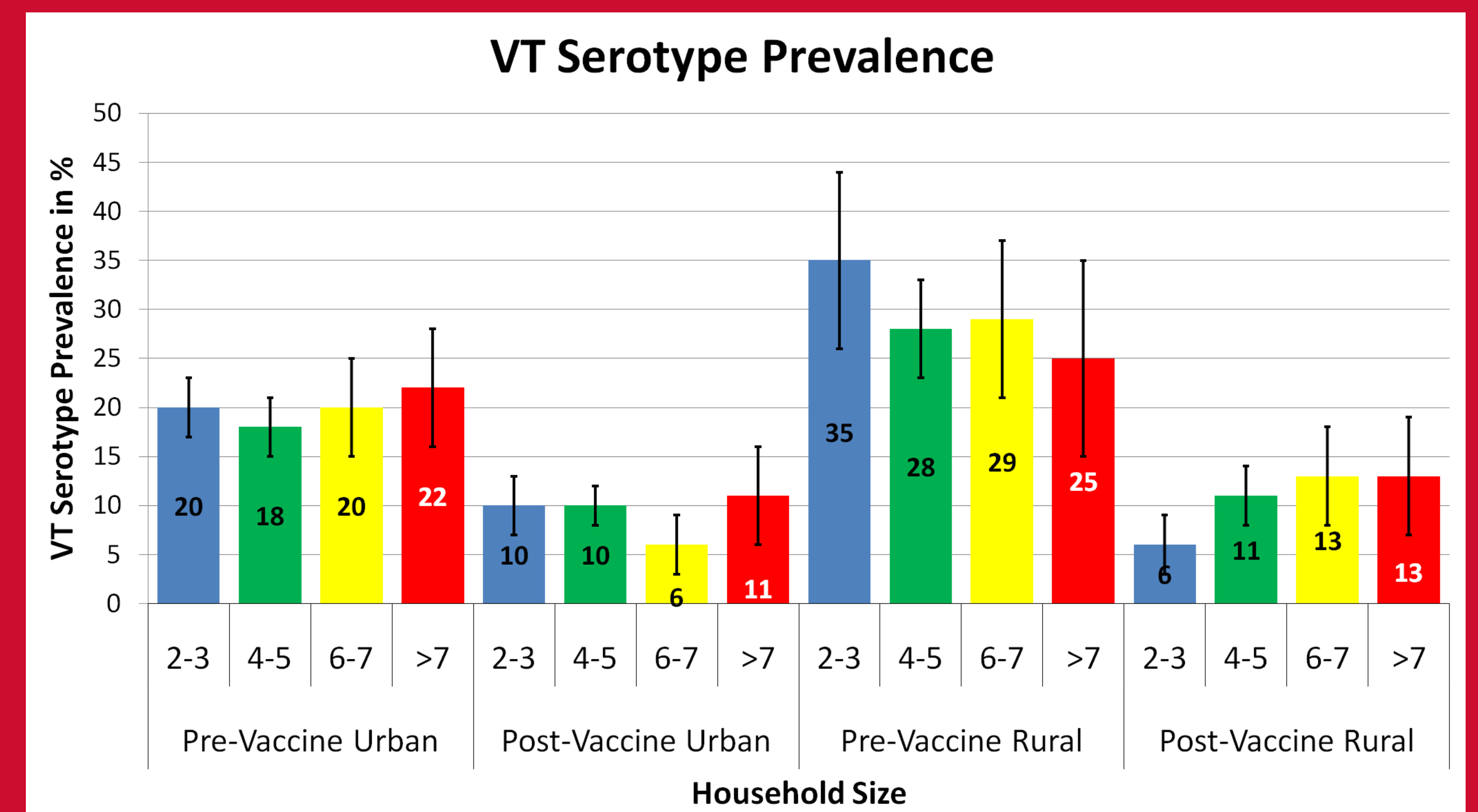


FIGURE 2

Vaccine Type Serotype by Household Size



- **Before PCV10 introduction**, vaccine type (VT) serotype prevalence in **urban households** with 2-3, 4-5, 6-7 and >7 members were 20% (105/516), 18% (139/769), 20% (59/289) and 22% (38/175) respectively (p value=0.404).
- Similarly, VT serotype prevalence in **rural households** with 2-3, 4-5, 6-7 and >7 members were 35% (40/113), 28% (83/296), 29% (38/132) and 25% (15/59) respectively (p value = 0.322).
- **After PCV10 introduction**, VT serotype prevalence in **urban households** with 2-3, 4-5, 6-7 and >7 members household were 10% (43/412), 10% (65/646), 6% (17/265) and 11% (18/169) respectively (p value = 0.414).
- VT serotype prevalence in **rural households** with 2-3, 4-5, 6-7 and >7 members were 6% (12/188), 11% (47/412), 13% (26/205) and 13% (14/109) respectively (p value = 0.268).

CONCLUSION

- No significant association between increase in household size and pneumococcal NP carriage prevalence before and after PCV10 vaccine introduction.
- No significant association between increase in household size and VT serotype prevalence before and after PCV10 vaccine introduction.

REFERENCES

- 1 Hodge CW, Reichler MR, Dominguez EA et al. An Epidemic of Pneumococcal Disease in an Overcrowded, Inadequately Ventilated Jail. N Engl J Med 1994;331:643-648 (Available at: <http://www.nejm.org/doi/full/10.156/NEJM199409083311004>)

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