

# Does my hand trump yours? Microbial contamination levels of playing cards.

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## Background

Bridge is a trick-taking card game played with a standard 52 card deck of playing cards. Decks of cards are used by multiple players with individuals handling up to 11 decks per night.

Individual players will have varying levels of hygiene compliance and microbial flora, therefore the sharing of these decks could lead to cross transmission amongst club members. Additionally these clubs often consist of older members of society who may be more prone to underlying health conditions. This means that in combination with a transmission route, these players may be at higher risk of health consequences.

Due to the regulated nature of the game, it is possible to record the number of uses of cards at a bridge club. As bridge uses all 52 playing cards but not the Jokers, each deck has two cards that can be used as internal controls.

Any transmission between cards in a Bridge club setting could potentially be extrapolated to other settings, such as care homes, where cards are shared by vulnerable members of society.

## Methods

Twenty eight test decks of standard playing cards (T) were circulated for two evenings at the Northfield Bridge Club in Birmingham, England. Prior to the decks being utilised for play the two jokers were removed for use as internal controls (J).

Two unopened decks from the same batch of cards were used as controls (C) and two decks. Two more decks from the Bridge Club that were being withdrawn at the end of their natural play cycle (~ 50 hands) were also screened (E).

Total viable counts were measured from the front and back of 10 pre-determined cards from each T deck (n=560), C deck (n=40) and E deck (n=40). Total viable counts were measured the Jokers (J) in each of the T decks (n = 112) (Figure 1).

Any individual colonies isolated were identified by MALDI-ToF and characterised as skin, respiratory or faecal flora.



Figure 1. Laboratory photos of the pre-determined playing cards selected for culture and counting.

	Mean Colonies	Standard Deviation
T Cards	17.91	5.41
J Cards	4.73	5.74
C Cards	0.60	0.03
E Cards	15.75	1.26

Figure 2. Mean and standard deviation of colonies from total viable counts (TVC) from each type of deck.

## Results

Viable colonies were isolated from 100% of the test cards with a mean count of 17.91 (Figure 2.) When analysed using a one factor ANOVA the test decks were significantly different from each other (P=0.001). However when individual cards were compared they were not significantly different (P=0.0381), nor were the fronts different to the backs (P=0.357).

Skin, respiratory and faecal flora were all detected upon the test decks, including *Enterococcus faecium* which was present in seven of the twenty eight test decks.

The mean colonies on the end of life (E) decks and Test (T) decks were not significantly different, with one of the two E decks containing the faecal flora *Enterococcus faecium*.

The J cards and C decks had significantly lower loads of colonies and faecal flora was not identified on any of the control cards or decks.

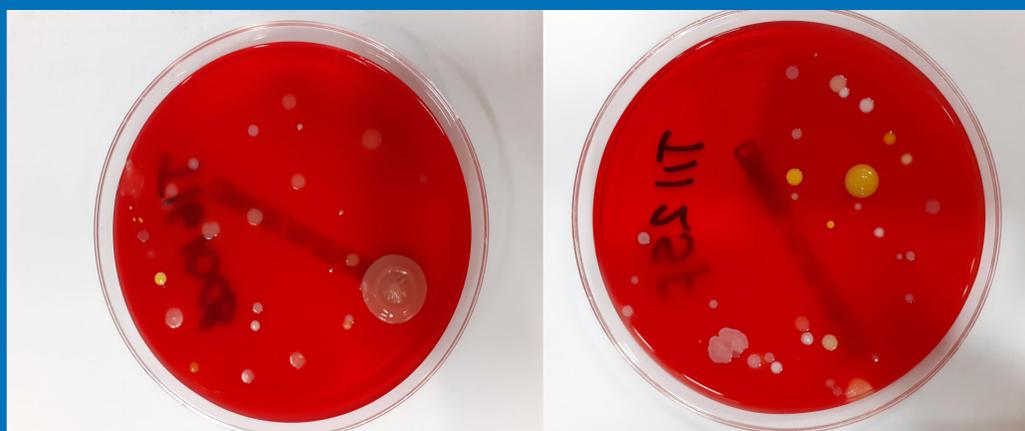


Figure 3. Example colony growth from Test Decks on CBA.

## Conclusions

This study demonstrated that card contamination is not evenly distributed during play and that potential pathogens can be identified after a limited interaction with playing cards in a shared setting.

Although this study only provides a snap shot of data in one setting the results could be extrapolated to other settings such as care homes, hospitals and schools where cards are shared over a protracted period. Results indicated it may be beneficial to regularly replace cards within these high risk environments in order to protect vulnerable members of society.

