Research Team:

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Evaluation of the impact of mobile money payment system on the morale and work output of community health workers implementing polio vaccination campaign in Malawi (PayDig)

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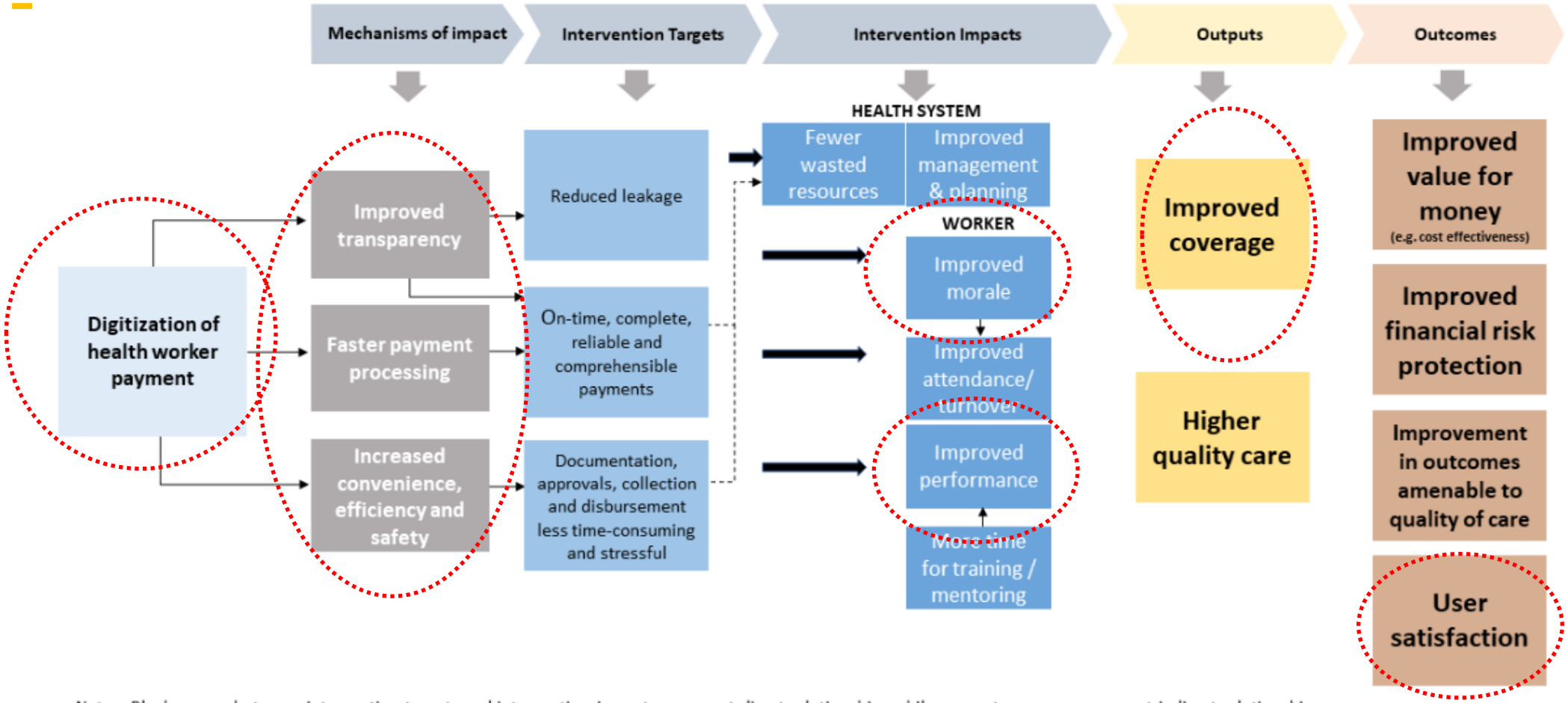
Introduction: Vaccination and Public Health Emergencies

- Public Health emergencies require urgent interventions
  - COVID-19, Polio or Cholera outbreaks
- Vaccination (immunization) is one of the effective interventions
- High population coverage *(% of people vaccinated)* is required to prevent community transmission.

Introduction: Health Workers' Performance &Vaccination coverage

- Highly motivated health workers and "volunteers" are needed to achieve high vaccination coverage.
- In Malawi, typical mass vaccination campaign team: Health Surveillance Assistants (HSAs), Community Volunteers (CVs), Social Mobilizers, Supervisors
- Cash payments for vaccine health workers & volunteers → delayed payments, theft, long travel → demotivation → poor work performance.
- ? Digital payment methods may facilitate the efficiency of health worker remuneration→ improve motivation→ improve work performance.

Theoretical Framework: Global Digital Health Payment System



Notes: Block arrows between intervention targets and intervention impacts represent direct relationships while connector arrows represent indirect relationships. While this model represents linear relationships, there are likely to be more complex and adaptive interplays between the variables and levels in the conceptual model that are not captured here.

McConnell *et al*. 2022

PayDig Study Objectives

1. To describe the **processes for operationalizing mobile money payment** system for community health workers and volunteers during the Polio mass vaccination campaign in Malawi.

2. To identify **facilitators** and **barriers** affecting the implementation of a mobile money payment system for community health workers and volunteers in Malawi.

3. To assess the trend in **polio vaccination coverage** before and after rolling out a mobile money payment system for community health workers implementing a polio vaccination campaign.

PayDig Study—Secondary Objectives

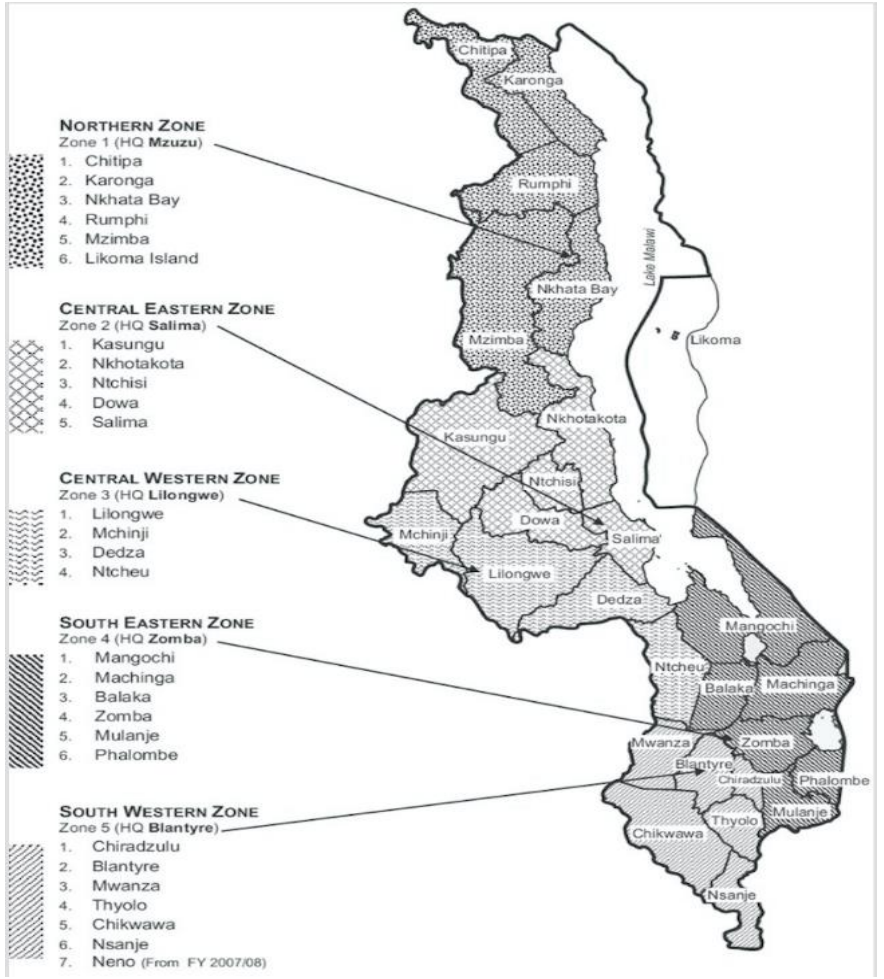
4. To describe the level of **motivation** and **satisfaction** of community health workers and volunteers receiving mobile money payments during the implementation of a polio vaccination campaign.
5. To explore the level to which mobile money payment system **shift gender barriers** that affect performance of community health workers and volunteers during vaccination campaigns.
6. To explore the **unintended consequences** of mobile money payment system for health workers and volunteers and on the users and implementers of digital payment.

Methodology—Study Design

- Phenomenological **qualitative** plus **quantitative** study—mixed methods approach
  - **Key Informant Interviews (KIIs)** with central and district-level vaccination campaign managers and coordinators
  - **Focus Group Discussions (FGDs)** with field vaccination teams
  - **Secondary data analyses** using routine EPI vaccination coverage data

Methodology—Study Setting

- **Rumphi** –Northern Zone;
- **Mchinji** – Central Western Zone;
- **Salima** – Central Eastern Zone,
- **Phalombe** – South Eastern Zone
- **Chikhwawa** – South Western Zone
- **Lilongwe** – Central Western Zone;
- **Blantyre** – South Western Zone



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Methodology—Study Population & Sample Size (FGDs)

1-2 FGDs close to Boma

- Vaccination Team
  - Health Surveillance Assistants
  - Community Volunteers
  - Social Mobilizers

1-2 FGDs in hard-to-reach area

- Vaccination Team
  - Health Surveillance Assistants
  - Community Volunteers
  - Community Mobilizers

FGD (n=6-12)
Total=14 FGDs

Methodology—Study Population & Sample Size (KII)

~ 7 respondents—Central Level

- Polio Mass Vaccination Program Managers (MoH, WHO)
- Officers managing mobile money payments (MoH, WHO)
- Mobile Network Operators

~ 7 respondents– District Level

- Director of Health and Social Services
- District Environmental Health Officer
- Human Resource Manager
- Accountant
- EPI Coordinator
- Supervisors of Community Health Workers (AEHOs)
- Mobile Network Operators

Methodology—Data Collection & Analyses

- Protocol reviewed and approved by Ethics Committee
- Study protocol training for research assistants (RAs)
- Pilot testing of study tools
- Tape recorded interviews by Co-Investigators @ central level and by RAs @ district and sub-district levels
- Study Statistician sought permission from Director of Health and Social Services to extract vaccination coverage data

Methodology—Secondary Data Analyses

- Extracted data into MS Excel from the district Health Office's DHIS-2 system data on the number of under-5 children receiving vaccination in each of the four rounds within each health center catchment area.
- Denominators for calculating vaccine coverage: Projected under-5 children populations from the Malawi National Statistical Office (NSO).

Methodology—Data Analyses

- Tape recorded data from the KIIs and FGDs were transcribed verbatim.
- RAs transcribed and then translated the data from local languages into English
- Transcripts uploaded and analyzed using NVIVO version 12 software
- RAs read a sample of the transcripts and constructed a codebook of themes that emerged.
- Data analyzed thematically and inductively until saturation point was reached
- Vaccine coverage data experted into STATA version 17.0
- Qualitative findings were triangulated with the quantitative findings.

Methodology—Study Period

	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23
Phase I: Inception									
Protocol development									
Ethical approval(s)									
Hire and train data collection teams									
Phase II: Data collection									
Collation & Review of secondary data									
Participant interviews									
Translation & transcription of interviews									
Coding									
Analysis (Qual & Quant data)									
Phase III: Reporting & Dissemination									
Draft Report writing									
Report Validation (District-level)									
Report Validation (National-level)									
Manuscript writing									
Policy-brief writing									
Phase IV: Dissemination									
Journal Submission									
Conference Presentation (Local)									
Conference Presentation (International)									

Results: Characteristics of Study Participants

Characteristic	KII participants (N=47)
Position	
• [1]EPI Coordinators	7
• [2]DEHO	7
• [3]DHSS	6
• Human Resource Officers	7
• [4]AEHO	7
• Accountants	7
• Mobile Network Operators	2
• MoH headquarter officials	2
• [5]GPEI members	2
Age in years, median (range)	42 (25-59)
Gender, n (%)	
Male	34 (77%)
Female	10 (33%)
	FGD participants (N=195)
Position, n (%)	
Healthcare Workers	101 (52%)
Volunteers	88 (45%)
Social Mobilizers	6 (3%)
Gender, n (%)	
Male	109 (56%)
Female	86 (44%)

[1]EPI=Expanded Program in Immunization; [2]DEHO=District Health Environmental Health Officers, [3]DHSS=Director of Health and Social Services, [4]AEHO=Assistant Environmental Health Officers, [5]GPEI=Global Polio Eradication Initiative.

Objective #1: Mobile money payment (MM) operationalization

Disaster Declaration

- Presidential political commitment
- International technical support mobilization

National Stakeholders Engagement

- Multilateral agencies
- Mobile Network Operators
- Reserve Bank of Malawi clearance

Health worker database creation

- Health Manager Orientation
- Data compilation
- Database verification & revision

Campaign roll out

- Mass vaccination
- Phased mobile money payment

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Objectives #1: Stakeholders views on MM operationalization

- CHWs and CVs frequently reported successful implementation of the mobile money payment system, mostly because of good advocacy efforts, stakeholder engagement and community sensitization
- …but some central and district-level stakeholders felt excluded in the whole process

"…..WHO is the one that is responsible for making payments but I feel that it could have been better if we were involved in making the payments because there are lots of errors and delays which we could have avoided if we were involved as a district." (KII-Salima)

"What we don't know is the process that took place between the partners like WHO and the network providers and on what happens when WHO is paying the network provider. Sometimes we think that maybe what happens between WHO and mobile network operators is the issue that causes the delays or is it WHO itself but what is known is that it takes longer for the beneficiaries to get paid."(KII-Central Level Stakeholder).

Objectives #2: Stakeholders views on MM operationalization

- Stakeholders and beneficiaries experienced various challenges with the preparation, organization and execution of the mobile money payment system
  - Errors in recording particulars of beneficiaries → delayed payment
  - Poor communication to the beneficiaries on reasons for delayed payment→ frustration
  - Animosity by campaign field workers towards district-level managers due to untimely resolution of errors→ frustration
  - Poor planning and disorganization at district level due to frequent and untimely database changes
  - Mistrust between central-level and district level: suspicion of fraud

"We were not impressed with the way the registration process of health workers was done because we feel that certain decisions and changes were done inconsiderately. For example..... you find that two days before the campaign starts when the money is already in the wallet ready to be paid ... the district indicates that they would like to withdraw about 40 names of health workers identified to participate in the campaign" **(KII-Central level stakeholder)**

" .. there has been a case for example when the district's allocated budget is for 500 vaccination recorders. The district would then submit 470 names of vaccination recorders and if they are told to add 30 names on top, instead they added 100 names which are not budgeted for… " **(FGD-Central Level stakeholder)**

Objectives #2: MM facilitators and barriers

- Availability of good mobile phone network coverage in **urban and semi-urban areas** was a major facilitator for successful implementation
- Barriers experienced in many **rural areas**
  - Poor mobile phone network
  - Limited availability of cash among mobile phone agents
  - Long travel distances to access mobile money payment agents
  - Poor digital literacy, particularly for community volunteers
  - Lack of ownership of personal phone handsets
  - Resistance to adopt innovations

"We fail to access the allowances given on time because of lack of agents in this area. Agents here are few, so sometimes they say they have run out of cash, then we have to wait for them to gather the cash. This makes us prefer cash payment than digital payment because we suffer in our houses yet we have money in our phone but if there can be an improvement on availability of agents in this area, digital payment is very good." ***(*FGD-GOLA-Chikwawa*)***

Objective #3: District Roll out of MM payment

1. Round 1 (March 2022)
2. Round 2 (April 2022)
3. Round 3 (August 2022)
4. Round 4 (October 2022)

Mobile Money Payments Trend in R1,R2 & R3

Round 1 Mobile Money Districts		
Snr	District	Beneficiaries
1	Balaka	584
2	Blantyre	881
3	Chikwawa	724
4	Chitipa	196
5	Dedza	787
6	Lilongwe	1,506
7	Mzimba N	541
8	Neno	135
9	Nkhotako	342
10	Zomba	796
11	Dowa	661
12	Likoma	21
13	Nkhatabay	28
Total		7,154

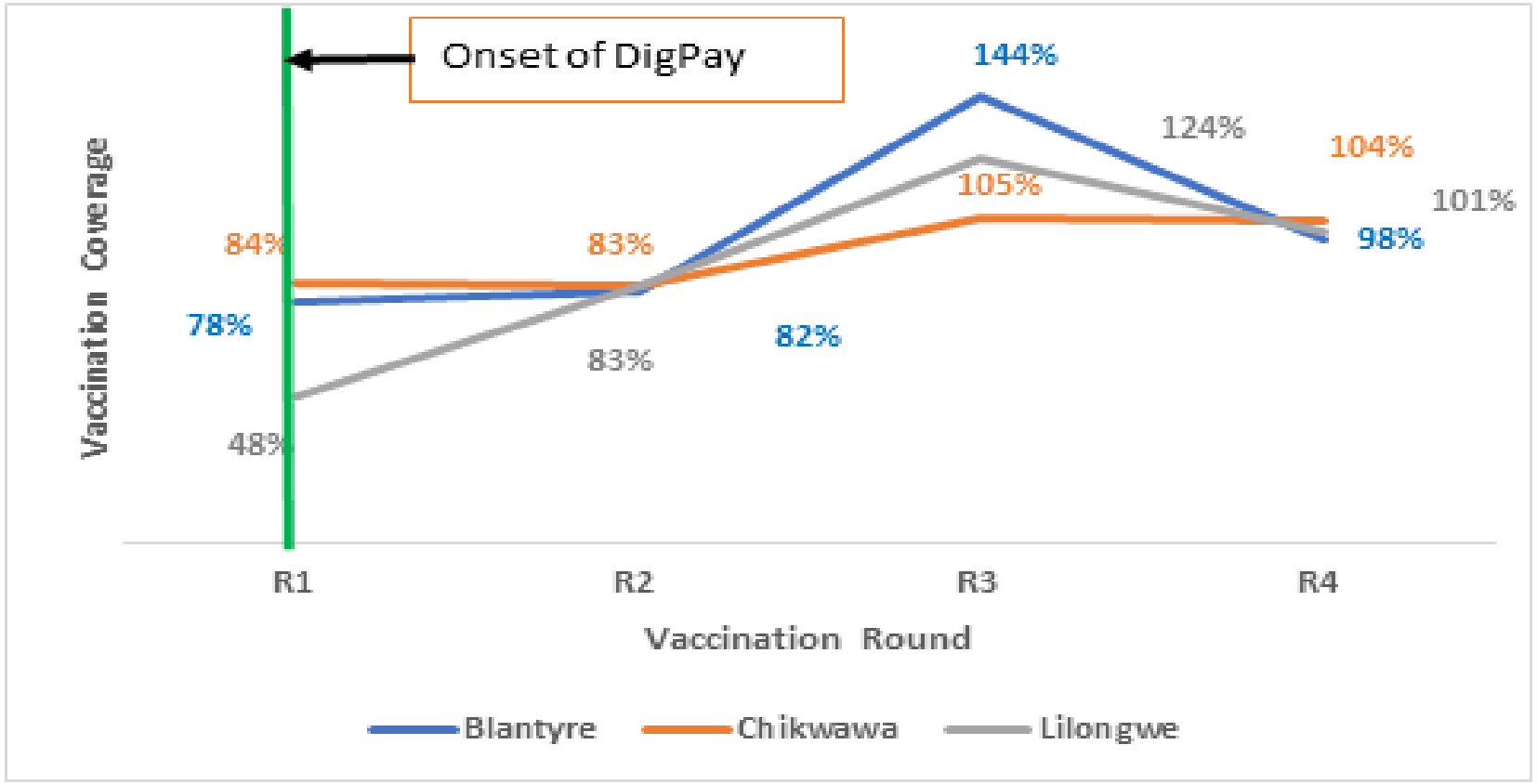
Note: In R1 we paid 45% 13/29 districts using Mobile Money. In R2 we increased the scope to approximately 60%. In R3 we paid all 29 districts using Mobile Money

Round 2 Mobile Money Districts		
Snr	District	Beneficiaries
1	Balaka	476
2	Blantyre	1,085
3	Chikwawa	610
4	Chitipa	213
5	Dedza	776
6	Lilongwe	2,266
7	Mzimba North	510
8	Neno	152
9	Nkhotakota	401
10	Zomba	838
11	Dowa	682
12	Likoma	45
13	Mwanza	146
14	Rumphi	219
15	Ntcheu	621
16	Nsanje	332
17	Mulanje	671
Total		10,043

Round 3 Mobile Money Districts		
Snr	District	Beneficiaries
1	Balaka	527
2	Blantyre	1,174
3	Chikwawa	685
4	Chitipa	276
5	Dedza	867
6	Lilongwe	2,318
7	Mzimba North	598
8	Neno	186
9	Nkhotakota	485
10	Zomba	924
11	Dowa	735
12	Likoma	23
13	Mwanza	178
14	Rumphi	298
15	Ntcheu	676
16	Nsanje	411
17	Mulanje	836
18	Salima	429
19	Karonga	365
20	Mzimba South	626
21	Nkhatabay	381
22	Kasungu	872
23	Ntchisi	344
24	Mchinji	619
25	Machinga	873
26	Mangochi	1,551
27	Phalombe	551
28	Chiradzulu	393
29	Thyolo	757
Total		18,960

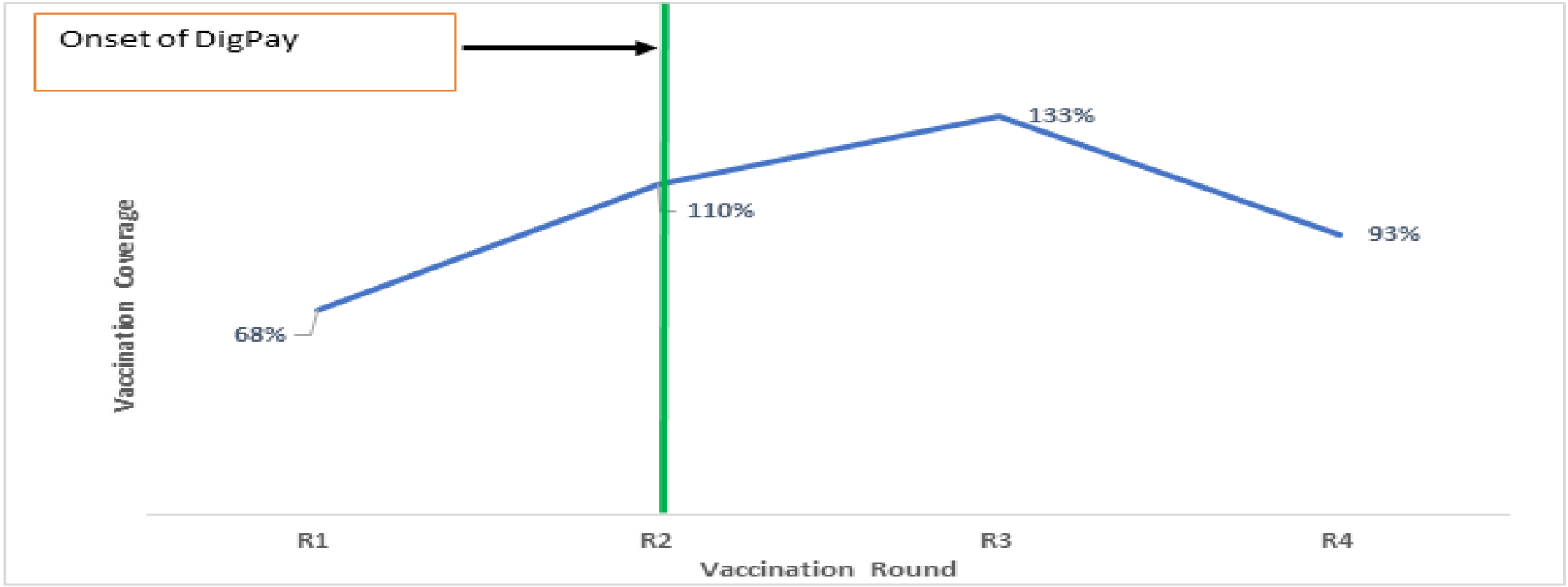
- In R3 all 18,960 beneficiaries were paid within hours of completing the campaign
- 99,6 % of the target beneficiaries were paid on the last day of the campaign.
- The less 0.4% not paid were mainly late submissions or replacements

Objective #3: Trends in vaccine coverage (R1 districts)



Mixed picture: improved coverage in all districts, but decrease in R4

Objective #3: Trends in vaccine coverage (R2 district)



Mixed picture: improved coverage but a decrease in R4

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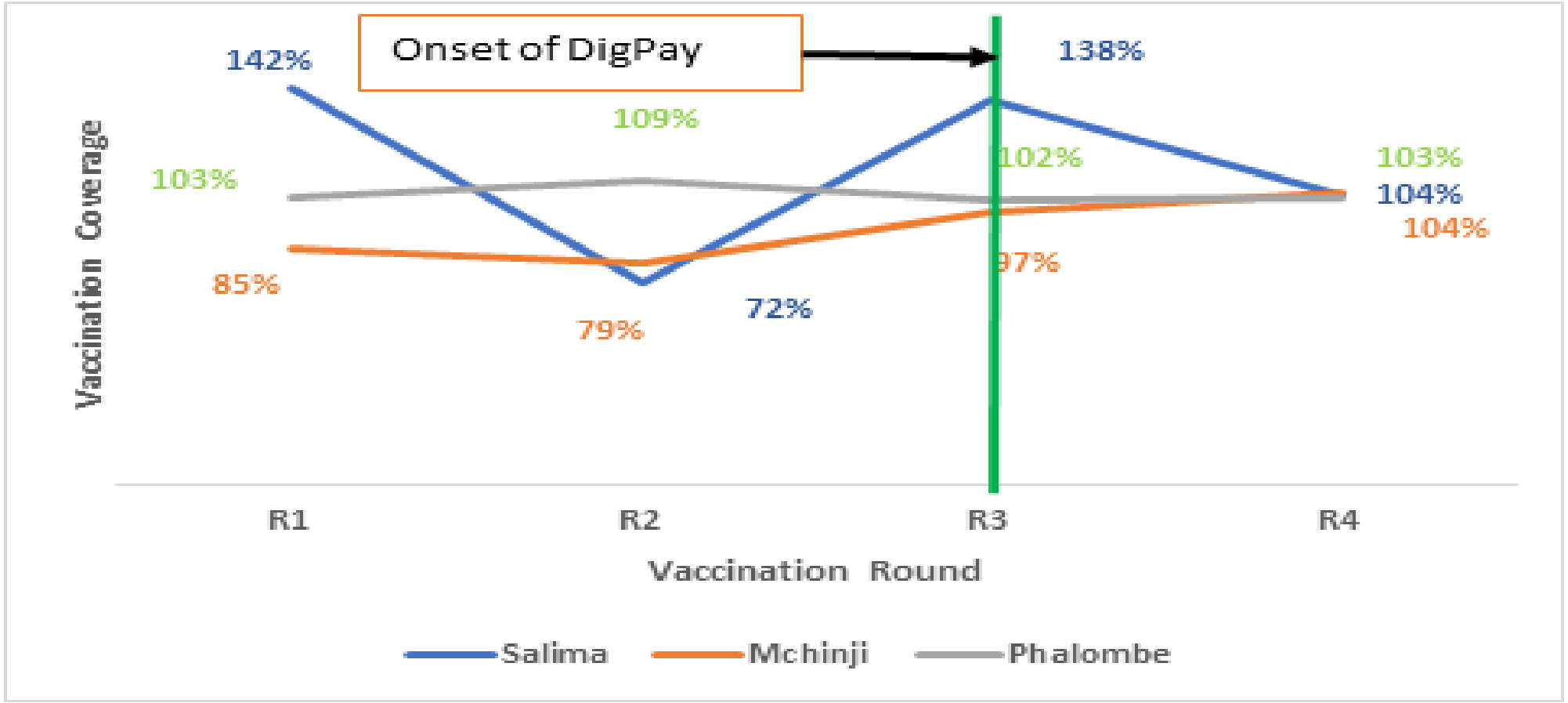
Objective #3: Trends in vaccine coverage (R3 district)



Mixed picture: improved coverage in 2 district, stable in 1 district

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Objectives #3: Stakeholders' view on poor coverage

- Round 1 low coverage likely associated with school holidays,
- Round 2 low coverage partly due to a reduction in the vaccination period from 6 to 4 days and harvest season when parents and caregivers were busy in the fields.
- Round 4 low coverage likely due to Implementation challenges with the MM payment system
- Community-level and health system challenges: household absenteeism, adverse weather, myths and misconceptions,

"…… we are meeting that challenge of people moving out to different places due to problems we are having in Malawi. Many people are going out in search of food and money to help their families and when these people are moving they go together with their children. While some move to other areas due to marriages. ……..this reduces the number of children we had in this area and when we go there for vaccination we do not find the children. The number of missing children can add up to 2%."(**FGD-Mchinji)**

"Since round 1 was conducted in the rainy season few children were vaccinated because we failed to reach some of the areas. In round 1, I vaccinated 110 children, while in round 2 and 3 I managed to vaccinate more than 200 children because it was not a rainy season and mobility was easy for me ."(**FGD-Rumphi)**

Objectives #4: Levels of satisfaction

- CHWs and CVs frequently reported being satisfied with the mobile money payment system used in the polio vaccination campaign for several reasons:
  - Convenience
  - Reduction in transport cost to access the cash
  - Improved cash safety and security
  - Assurance of getting the expected payment
  - Ease of using the money for other payment transactions

"Receiving allowances via mobile money was the easiest way. We could not walk long distances to access our allowances, payments were made on the same day for all of us. We could withdraw the money right there and use it to buy food right there in the field." **(FGD-CHWs-Phalombe).**

"The digital payment system is very good as it provides a security guarantee because no one can easily rob your money as the funds are transferred electronically to your phone." **(FGD-Rumphi)**

Objectives #4: Levels of motivation

- Most CHWs strongly indicated that timely payment of their allowances (receiving the agreed amount before or during the campaign) was a major motivator to their performance.
  - Any payment after the campaign resulted in poor performance

"I can say that it is a good initiative because one works with all their heart since you have the cash already. As such you work so hard to meet the target."(**FDG Chikwawa)**

"I have been motivated because as soon as I finish the work the payment is done and my family is happy that I worked for the Ministry of Health which has helped me to feed my family." **(FGD Rumphi)**

"I can say it's 50-50. To those who received the money in time it has motivated them. While those who received the money late are not motivated because they see the system as bad to the point that some workers didn't even meet their targets. Those who received money on time were working very hard and they reached their target."(**KII, Chikwawa)**

Objectives #5: Effects of MM on gender relations

- Facilitating female CHWs' and CV's access to funds unlike cash-based system
- Enhancement of women's economic empowerment and freedom.
- Reducing mistrust between husband and wife and enhancing their relationships.
- Facilitation of disclosure of personal income between spouses.

"When we were receiving money by hand and we spent the whole day here and went back late, the husband could not believe that we were made to wait and they could think that we were out having an affair. While this method has simplified things, when they say we will receive via phone we just receive the money."(**FGD-Chikwawa)**

"*Mobile payment has also helped in easing cases of mistrust with our husbands since they are able to see for themselves from the phone message the true source of the money, unlike previously when it was by hand. For example, when we received K5000, they could think that it was impossible to wait the whole day just to receive K5000 so there could have been conflict just because he thinks that I was with another man***."(FGD-Chikwawa)**

"Since I am paid via mobile money my husband might not know that I have received the money. I can even delete the transaction message so that he is not aware of any transaction that happened. So to me this is one way of securing my funds. If paid by cash my husband can easily collect the cash and use it to buy beer."(**FGD-Blantyre,)**

Objectives #6: Unintended effects of MM payment

- Unauthorized use of the funds by husbands *(for those without mobile phones)*
- Negative attitudes of CHWs and CVs towards campaign coordinators *(when some receive payments and others do not)*
- Fraudulent registration and payment of those not participating in vaccination campaign

"I used the phone number of my husband, when the allowances were deposited my husband withdrew the money and used it without letting me know. When I asked him about this he became furious and this has led to conflicts in our households."(**FGD-Lilongwe)**

"So if it happens that the payment is not processed then we think that the administrators have mismanaged our funds and that they are unprofessional. This negatively affected our relationship." **(FGD-Mchinji)**

Since we just take it from the names which have been submitted, unlike when we are paying by cash. I think it can be easier to be deceived because with cash when there is a new face among those who were working, HSAs are able to point out that that person is not one of them but here the money is just paid directly into an account" (**KII-Chikwawa).**

Summary

- Generally, mobile money payments improved CHWs and CVs motivation and satisfaction, if implemented optimally
- Improved satisfaction was mostly due to timely payment but also due to be improved gender relations.
- Implementation challenges negatively satisfaction and motivation of CHWs and CVs, particularly those in remote, hard-to-reach communities,
- No conclusive evidence that implementation of the mobile money payment system improved polio vaccine coverage.
  - Many possible extraneous factors
  - Use of secondary data was a major limitation

Recommendations

- Create, regularly update and maintain a database for CHWs and CVs and orient them in digital literacy
- Implement a hybrid payment method for hard-to-reach areas which combines cash and mobile money payment until mobile phone network and availability of adequately resourced mobile money agents improves.
- Include transport reimbursements when paying CHWs and CVs living in hard-to-reach areas to minimize the income losses.
- Map out the availability of mobile phone agents in hard-to-reach communities and ensure that they are adequately capitalized during vaccination campaigns and other public health emergencies.
- MNOs should provide back-up support to the agents so that they can resolve emerging challenges.
- Establish formal collaboration between MNOs and health officials at district level and regular consultations during vaccination campaigns.

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