

DECEMBER 2025



## **ALTERNATIVES TO VOUCHERS FOR INSECTICIDE-TREATED NET (ITN) DISTRIBUTION IN A DIGITALIZED ITN CAMPAIGN: OPTIONS AND DECISION GUIDE**

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# BACKGROUND

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Malaria remains a significant public health challenge, particularly in sub-Saharan Africa, where it places a sustained burden on communities. Insecticide-treated nets (ITNs) are a cornerstone of malaria prevention and are critical to reducing transmission in endemic regions. Achieving widespread, equitable ITN access depends on efficient and reliable distribution channels and strategies.

Historically, ITN mass campaign distribution has relied on paper-based vouchers issued to household representatives during household registration for redemption at designated fixed distribution points at a later time. With the digitalization of ITN campaigns, many countries have transitioned to scannable vouchers (QR/barcode) to speed validation and reduce clerical errors, support tracking and monitoring of ITN uptake, and to help identify ITN recipients and prevent duplication.

Voucher-based strategies face recurring challenges, including printing and logistics costs, loss or damage of vouchers, delayed reconciliation at the end of the registration/distribution period, and duplicate or fraudulent claims. The use of digital platforms and apps enables alternative verification and issuance pathways that can complement or replace scannable vouchers,

such as national ID-based verification, household tokenization (QR cards or stickers linked to a registry), and e-vouchers delivered via SMS/USSD/QR.

These alternatives can reduce costs associated with printed vouchers and strengthen programme integrity; however, they also introduce risks, particularly digital exclusion and privacy concerns that require explicit mitigation strategies.

This guidance helps national malaria programmes (NMPs) and partners design, select and implement alternative, digitally enabled methods for household identification and ITN issuance beyond traditional voucher models. It presents pros and cons of different options, documented best practices, and real-world examples to inform decision-making. This guidance will explore:

- Alternative approaches and technology-driven solutions in place of vouchers
- Pros and cons of each method based on country experiences
- Key implementation considerations
- Examples where alternatives have been successfully used

# THE CURRENT DEFAULT VOUCHER SYSTEM

Scannable barcodes on vouchers are now widely in use. For many NMPs, acquiring these can be time-consuming and expensive, involving international procurement and corresponding processes (customs and import,

etc.). If used, however, they can speed validation and reduce clerical errors, support tracking and monitoring of ITN uptake, and help identify ITN recipients and prevent duplication.

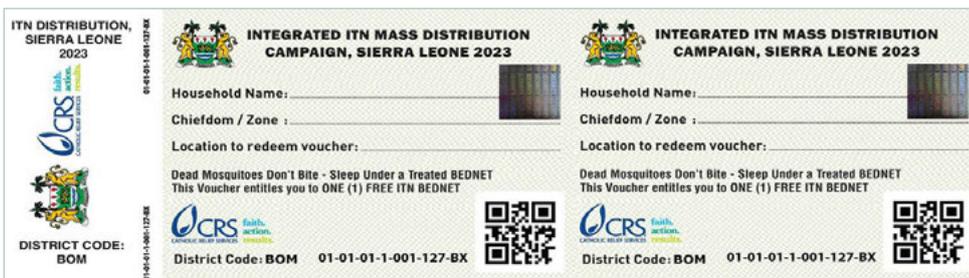
## 1. QR code/barcode on paper vouchers

### How it works

- During household registration, each household receives a paper voucher/s with a unique QR code or barcode. Depending on the design, one voucher can represent a single net or the entire household allocation.
- The voucher is linked to the household's record (household head, household size, assigned distribution point/date).
- At the distribution point, the household representative presents the QR/barcode paper voucher.
- Distribution point (DP) personnel scan the voucher on a mobile device to retrieve the pre-registered household details.
- DP personnel verify the details and allocation, issue the correct number of ITNs and record the quantity of nets issued.

### Examples:

#### Sierra Leone (2023 mass ITN campaign) – one voucher per net



#### Liberia (2024 mass campaign) – one voucher per household



## Strengths

- Links individual households to campaign records and supports verification at redemption.
- Improves accountability through reconciliation of nets issued against targets and gives a clearer view of who is/not covered.
- Strengthens traceability in fixed post strategies.
- Provides a physical token for cross-checking against registers or digital data.
- Able to carry key social and behaviour change (SBC) messages including providing information to households on where to redeem nets/identify distribution points.
- Serves as a reminder to a household when there is a long gap between registration and distribution.
- Acts as a certificate of eligibility when no alternative ID is available.

## Limitations

- Upfront procurement complexity and cost for secure, pre-printed vouchers (with QR codes/barcodes): international tendering, vendor vetting, proofing, shipping/customs, and long lead times can delay campaigns and inflate budgets.
- High printing costs and paper waste. Note that is not recommended to print one voucher per net due to additional costs – programmes should work to allocate one voucher per household where paper vouchers will be used/printed.
- Storage, transport and handling add to the logistics burden.
- Chain-of-custody complexity and supervision burden, need to tighten tracking and accountability, including rapid reconciliation at the end of the registration phase to avoid leakage.
- Lost or damaged vouchers at redemption. Relies on households safely retaining vouchers until distribution.
- Misprints, poor print quality, scanning failures, and incorrect household registration data reduce data quality.
- Risks of counterfeiting and weak chain-of-custody if controls are light.
- Slower verification/reconciliation cycles; intensive post-event data review.



# DIGITAL ALTERNATIVES TO VOUCHERS

## 2. Household card/sticker (tokenization)

### How it works

- During household registration, teams enter household details in the digital system, which automatically generates a unique alphanumeric code (e.g. 8–10 characters, avoiding ambiguous characters such as O/0/I/1; optional checksum).
- The code is written/printed on a durable card or sticker that may also include basic SBC information (where/when to redeem) and the designated distribution point/date.
- During the distribution period, the household representative presents the card/sticker, DP personnel manually enter the code in the digital platform (or, if illegible, search by household details) to retrieve the record. No scanners or barcodes are used.
- The system validates the household's eligibility and displays details such as number of nets allocated, household details (e.g. registered members, location).
- DP personnel verify eligibility/allocation, issue the correct number of ITNs, and record redemption.

### Examples:

#### Ghana – 2018 mass ITN campaign

A household card/sticker for the 2018 LLIN PMD campaign in Ghana. At the top center is a circular logo with a stylized figure. Below it, the text "2018 LLIN PMD" is prominently displayed. Underneath is a "CODE:" field consisting of ten boxes: the first three are empty, followed by a hyphen, then three more empty boxes, another hyphen, and a final empty box. Below the code field are four lines for text entry: "Name of Community:", "Name of Household Head:", "Name of Distribution Point:", and "Date of Distribution:". At the bottom, the slogan "SLEEP UNDER A TREATED BEDNET FOR A GOODLIFE" is written in green. Below the slogan are several logos, including USAID, the U.S. President's Malaria Initiative, and the LLIN logo.

## Nigeria – 2024 pilot in Ogun State





Faith knows  
no bounds



**e-Token Record Slip**

Token ID:    •    •

Date of Net Collection: .....

Distribution Point: .....

No of ITNs due Household: .....

Name of the HouseholdHead: .....

Mobilizer Name/Phone Number: .....

### Strengths

- Provides a clear **physical reminder** of when/where to redeem and a simple artifact for community mobilization.
- Substantial **cost savings** versus printed QR codes.
- Enables deduplication and reconciliation via unique codes linked to the registry.
- Minimal specification for mobile devices since **no scanners/cameras are** required to read compactible QR codes.

### Limitations

- High printing costs and paper waste. Note that is not recommended to print one card or sticker per net due to additional costs – programmes should work to allocate one card or sticker per household where paper will be used/printed.
- Transcription and legibility errors can slow verification and cause mismatches; handwriting quality matters.
- Loss or damage of cards/stickers requires a reissue process and can delay redemption.
- Integrity risks (code sharing/forgery) if codes are predictable or poorly controlled; requires strong code design and chain-of-custody.
- Logistics burden for printing, storage, and distribution of cards/stickers.
- Manual entry can be slower compared to machine-readable QR codes.
- Data quality can suffer if codes include ambiguous characters or lack a checksum and formatting rules.

### 3. National ID-linked verification

#### How it works

- During household registration, the household head or representative presents a national ID to be linked with the registration data. Accepted ID types may include government-issued identification (e.g. national ID card, voter ID, health/insurance ID, passport, etc.).
- The ID number is entered into the ITN registration system together with household details.
- During ITN distribution, the household head or representative presents the same national ID used at registration.
- The ID number is entered (or scanned) into the digital platform by distribution personnel to retrieve the household's details.
- Once verified, the household is issued the allocated number of ITNs.

#### Strengths

- Provides a unique, person-level identifier that reduces duplicate or fraudulent claims.
- Enables fast verification (scan or number entry) with clear audit trails.
- Supports lean data capture (can store hashed ID only), improving privacy by design.
- Facilitates real-time or near-real-time deduplication across sites and days.
- No procurement process required. Lowers printing/logistics burden compared with paper vouchers.
- Integrates well with digital registries and dashboards for reconciliation.
- Enhances accountability by linking redemptions to verified individuals/households.

#### Limitations

- Risk of excluding people without valid IDs or with mismatched records.
- Requires legal/policy approvals and robust data protection compliance (consent, retention, access control).
- Privacy risk if raw ID data are collected/stored or shared inappropriately.

#### Examples:

#### Ghana (2021 ITN mass campaign) – ITN distribution linked to various government-issued ID types



## 4. Digital e-voucher via SMS/ USSD/QR code

### How it works

- During household registration, household registration personnel enter household details in the digital system (using a mobile device) and trigger issuance of an e-voucher (one time password [OTP]/token/QR).
- The token and basic instructions (where/when to redeem) are sent by SMS or returned on USSD; households can also retrieve the token later by dialling the USSD code or providing their phone number at the site.
- At distribution, the household presents the SMS/USSD token (or shows the QR on device).
- DP personnel validate the token in the app (online or offline with later synchronization), confirm eligibility and allocation, issue the ITNs and record redemption.
- Exceptions (no phone, lost token, wrong site) are handled at an exception desk with a documented fallback (e.g. household card/token, on-site lookup).

### Strengths

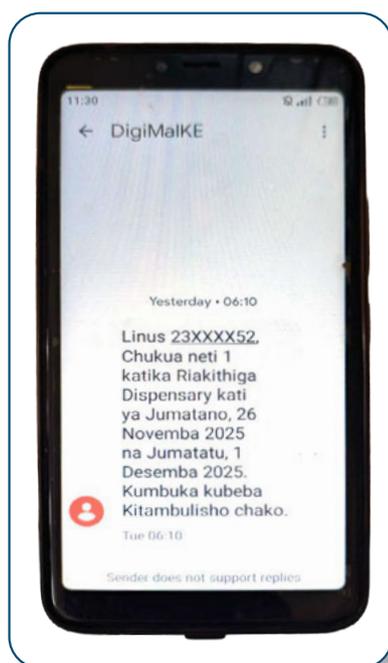
- Low printing/logistics burden; tokens issued instantly and re-issued easily.
- Fast verification and deduplication with short-expiry tokens and server-side checks.
- Near real-time visibility on redemptions; simpler reconciliation.
- Flexible messaging (SMS/USSD) to provide directions, time slots and reminders.
- Works well in urban/peri-urban areas with high phone access.

### Limitations

- Households without phones/SIMs or with low literacy may be excluded without other options.
- Reliance on mobile network connectivity and short code availability.
- Fraud risks (OTP forwarding, SIM swaps) if tokens are not short-lived and geofenced.
- Language barriers and message comprehension can reduce successful redemption.
- Data costs (if not zero-rated) and short code fees; integration and monitoring overhead.

### Example:

#### Kenya





## 5. Door-to-door “instant registration + POD”

### How it works

- During household registration, campaign personnel approach household and create a record on device.
- A minimum dataset is captured (household head name or alias, administrative location [community, village etc.], household size, persons-to-net fields, optional phone/landmark).
- Automatic app calculates eligible nets for the household based on the campaign ITN allocation rules.
- Nets are issued immediately; record proof of delivery (POD) as GPS + timestamp plus one: e-signature or named recipient confirmation.

### Strengths

- No printing/logistics for coupons/tokens—eliminates voucher and card/sticker production, storage and transport costs.
- Built-in guardrails (required fields, allocation calculator, reason codes) reduce doorstep data errors often found with manual paper logs.
- Digital stock linkage (lot-to-delivery) enables rapid reconciliation and automated alerts.
- Real-time/near-real-time dashboards to drive targeted re-visits and mop-up.
- Lower risk of “lost token” failures compared to printed vouchers or handwritten household codes.

*Delivering nets door-to-door allows all targeted households to receive their ITNs.  
Meena, Niger State, Nigeria. September 2022*



## Limitations

- Higher duplicate and fraud risk if deduplication rules are weak.
- Synchronization delays and conflicts in low connectivity can cause temporary duplicate or stale status.
- Data quality variability (names/addresses) and potential misclassification of household size.
- Route inefficiency if daily microplans are loose; lower throughput than fixed posts.
- Supervision and training intensity needed to keep eligibility/allocation consistent.
- Device/security dependencies (battery, loss, tampering).

**Table 1:** Alternatives to historical paper vouchers – comparison table

Method	Best for	Pros	Cons/risk	Safeguards
<b>QR/barcode paper voucher</b>	<p>Fixed-post campaigns in urban and rural areas where devices can scan offline/online.</p> <p>Contexts where households can safely keep voucher until distribution.</p> <p>Contexts where households can safely access fixed distribution points.</p>	<ul style="list-style-type: none"> <li>■ Eliminates manual data entry during issuing, streamlining ITN distribution.</li> <li>■ Fast scan-based verification.</li> <li>■ Strong traceability and reconciliation.</li> <li>■ SBC information on voucher; acts as reminder.</li> </ul>	<ul style="list-style-type: none"> <li>■ High cost of printing vouchers (that may involve international procurement for some countries, depending on the chosen digital platform).</li> <li>■ Requires extensive logistics for distribution and reconciliation across all levels.</li> <li>■ Might require additional IT support in the field to manage cases of vouchers not scanning.</li> <li>■ Needs effective tracking and management mechanisms including for quantification, dispatching, usage, reverse logistics and reconciliation (need for a robust tracking system).</li> <li>■ Risk of voucher loss or damage—recipients must securely store their QR/barcode vouchers.</li> <li>■ Audit requirements may include storing vouchers for an extended period of time before their disposal.</li> </ul>	<ul style="list-style-type: none"> <li>■ Establish a backup verification system (e.g. household name, phone number, community leader verification) in case of lost vouchers.</li> <li>■ Code embedded in the QR code is also printed on the voucher (potential cost implication).</li> <li>■ Develop an offline functionality to ensure reliability in areas with limited internet access.</li> <li>■ Train household registration and distribution teams on scanning procedures and troubleshooting.</li> <li>■ Implement a system for tracking unused vouchers and managing reverse logistics.</li> <li>■ Ensure the quality of the voucher material holding the QR/barcode, e.g. weather-resistant.</li> <li>■ Use a centralized system to monitor voucher usage and prevent duplication.</li> <li>■ Start with a small-scale pilot to identify and address challenges; expand (scale up) the programme based on pilot results and available resources.</li> </ul>
<b>Household card/sticker (tokenization – manual code)</b>	<p>Effective across most contexts, including remote areas.</p>	<ul style="list-style-type: none"> <li>■ Low-cost and simple. No need for scanning devices or internet connectivity during creation of the code.</li> <li>■ Works in remote areas including complex operating environments (COEs). Functions even where mobile technology is limited.</li> </ul>	<ul style="list-style-type: none"> <li>■ Risk of code loss – if handwritten codes are misplaced, recipients may struggle to verify eligibility.</li> <li>■ Manual entry errors – household registration assistants must transcribe codes accurately to avoid mismatches.</li> </ul>	<ul style="list-style-type: none"> <li>■ Ensure clarity in code format – use a standardized numeric or alphanumeric structure to avoid confusion (e.g. ABC123 or 458972).</li> <li>■ Careful attention has to be paid to defining how codes are generated by different distribution teams considering codes may be generated offline.</li> <li>■ Provide backup options – including use of names, telephone numbers, etc. as secondary means of verification.</li> <li>■ Encourage households with simple or smart phones to store the code in their phone or take a picture of the written code.</li> <li>■ Minimize errors by training distribution teams on accurate code entry and retrieval.</li> </ul>

Method	Best for	Pros	Cons/risk	Safeguards
<b>National issued ID-linked verification</b>	<p>Countries/areas of countries where national ID databases are well established and can be integrated into ITN distribution systems.</p> <p>Countries with strong government-issued ID systems.</p>	<ul style="list-style-type: none"> <li>■ Leverages existing systems – uses national ID databases, reducing duplicate records.</li> <li>■ Avoids additional cost in printing either vouchers or printed sheets for writing unique codes.</li> <li>■ Simplifies distribution – eliminates physical vouchers and handwritten codes</li> <li>■ Reduces the need for separate verification system</li> </ul>	<ul style="list-style-type: none"> <li>■ Excludes undocumented households – households without recognized IDs may not be able to register. Not appropriate for complex operating environments without risk assessment and mitigation plan.</li> <li>■ Requires secure database integration – must ensure ID information is protected.</li> <li>■ Manual entry risks – household registration teams must enter ID numbers correctly to prevent mismatches.</li> </ul>	<ul style="list-style-type: none"> <li>■ To increase accessibility, allow different types of national, voter or health IDs.</li> <li>■ Provide alternative process for households without national IDs (e.g. witness verification, telephone numbers, etc.).</li> <li>■ Train household registration teams to ensure that ID numbers are correctly entered and retrieved in the system.</li> <li>■ Implement privacy measures to protect household identity information.</li> </ul>
<b>Digital e-voucher (SMS/USSD/QR)</b>	<p>Urban/peri-urban with high phone access.</p> <p>Campaigns with a short time between household registration and distribution</p>	<ul style="list-style-type: none"> <li>■ No print logistics.</li> <li>■ Instant (re)issue.</li> <li>■ Fast server-side deduplication.</li> <li>■ Near real-time visibility.</li> <li>■ Flexible messaging for directions/slots/reminders.</li> </ul>	<ul style="list-style-type: none"> <li>■ Digital divide (no phone/low literacy).</li> <li>■ Network/short code reliance.</li> <li>■ OTP forwarding/SIM swaps.</li> <li>■ Language barriers.</li> <li>■ Messaging costs.</li> </ul>	<ul style="list-style-type: none"> <li>■ Short expiry tokens.</li> <li>■ Geofence/velocity checks.</li> <li>■ Assisted redemption desk.</li> <li>■ Multilingual templates.</li> <li>■ Zero-rating where possible.</li> </ul>
<b>Door-to-door instant registration + POD</b>	<p>Hard-to-reach areas; places where tokens are at risk of getting lost due to context.</p>	<ul style="list-style-type: none"> <li>■ No printing of vouchers/cards.</li> <li>■ No phone/SMS fees.</li> <li>■ Strong digital audit trail.</li> <li>■ In-app guardrails reduce errors.</li> <li>■ Rapid reconciliation and targeted re-visits.</li> <li>■ Fewer “lost token” failures.</li> </ul>	<ul style="list-style-type: none"> <li>■ GPS drift.</li> <li>■ Synchronization delays/conflicts.</li> <li>■ PIN/e-signature vulnerabilities.</li> <li>■ Doorstep data entry errors.</li> <li>■ Device/security dependencies.</li> </ul>	<ul style="list-style-type: none"> <li>■ GPS accuracy thresholds.</li> <li>■ Store-and-forward with conflict rules.</li> <li>■ Input validations.</li> <li>■ Mobile device management/encryption/screen-locks.</li> <li>■ Supervisor back-checks.</li> <li>■ Route plans and variance reviews.</li> </ul>

## 6. Emerging (not-yet-used in ITN distribution) alternatives — for pilot consideration

Voucher-based distribution is common in food assistance, social protection, humanitarian aid and subsidized services. Many programmes are shifting to digital approaches to improve efficiency, reduce fraud and enhance recipient experience. Potentially adaptable options for ITN campaigns include **e-vouchers, biometric verification, blockchain-backed ledgers** and **smart cards**, each with distinct advantages and challenges. The brief notes below outline two options suitable for piloting.

### A. Biometric verification (fingerprint/face)

**What it is:** Use of a biometric trait (e.g. fingerprint or facial template) to verify the person redeeming an ITN, reducing impersonation and duplicate claims.

**How it would work:** At registration, minimal biometric template is collected or matched to an approved national system where lawful and linked to the household record. At distribution, verification of the person takes place via a quick biometric check before issuing nets.

**Where it might fit:** Urban/peri-urban contexts with stable power/connectivity and supervised sites; targeted use in high-risk fraud areas or small pilots.

#### Potential gains:

- Stronger person-level deduplication and impersonation control than tokens or IDs.
- Faster verification with less manual data entry once devices are set up.

#### Risks and prerequisites:

- Requires lawful basis, explicit consent, and privacy-by-design (template encryption, no raw images where possible, short retention, audit).
- Needs reliable devices, back-up non-biometric pathways for failed matches, and clear inclusion safeguards (e.g. worn fingerprints, veils, disabilities).

### B. Self-registration portal (web/USSD) + assigned pick-up

**What it is:** A simple web or USSD channel for households to pre-register; the system assigns a nearby site and time window and returns a confirmation code.

**How it would work:** The portal is launched with clear SBC; households enter minimal details and receive a code (on-screen/SMS/USSD). At pick-up, staff retrieve the record by code or phone number and issue ITNs.

**Where it might fit:** Urban/peri-urban or mixed settings with moderate phone access where on-site registration creates bottlenecks.

#### Potential gains:

- Pre-event data capture smooths queues and reduces on-site data entry.
- Better data completeness/quality and targeted reminder messaging.

#### Risks and prerequisites:

- Digital exclusion risk—requires assisted registration (community health workers [CHWs]/kiosks) and an exception desk for walk-ins.
- Needs USSD/SMS arrangements, consent/privacy controls, and basic deduplication/validation rules.

# GLOSSARY

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**Blockchain-backed ledger**

A shared digital ledger operating as a decentralized database with data stored across multiple computers, making it resistant to tampering.

**Chain-of-custody**

Documentation or trail of the sequence of custody, control, transfer, analysis and disposition of electronic facts.

**Checksum**

A small block of data derived from another block of digital data to detect errors that may have been introduced.

**Deduplication**

Elimination of redundant data in a dataset.

**Geofence**

A virtual geographic boundary that enables a software response when a mobile device enters or leaves the area.

**Guardrails**

Pre-defined rules or checks that keep systems operating safely.

**Stale status**

Data that are out-of-date, or no longer accurate.

**Tokenization**

Security process. Sensitive data are replaced with a string of alphanumeric characters called a token. The original sensitive data are stored securely in a "token vault".

**USSD**

Unstructured Supplementary Service Data. A communication protocol allowing interaction between a mobile device and the GSM cellular network operator's computers, via short codes. It does not need internet access.



## AMP CONTACTS

To join the weekly AMP conference call each Wednesday at 10:00 AM Eastern time (16.00 PM CET) use the following Zoom meeting line:

<https://us06web.zoom.us/j/88935481892?pwd=h3cuJ3x5LOsR58YXcEaub8ULqu5LMj.1>

To find your local number to join the weekly call:

<https://zoom.us/u/acyOjklJj4>

To be added to the AMP mailing list visit:

<https://allianceformalariaprevention.com/join-us>

To contact AMP or join an AMP working group please e-mail:

[info@allianceformalariaprevention.com](mailto:info@allianceformalariaprevention.com)

For further information please go to the AMP website:

<https://allianceformalariaprevention.com>